The Growth of the Private Rented Sector:

The Implications for Housing Market Analysis and Planning for Housing Supply

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Contents

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Abstract

The focus of this study is on improving the evidence base for planning for housing supply in Northern Ireland. The thesis explores the impact of the major structural change in the housing market since the beginning of the 21st century – the rapid growth of the private rented sector. It examines how housing economics can contribute to a better understanding of the definition and delineation of the functional housing markets that are seen as providing the optimum spatial framework for planning for housing.

The research is grounded in the theoretical framework underpinning functionally defined housing market areas (HMAs) based on the economic concept of spatial arbitrage and resulting patterns of household migration. Within this framework, the research critically examines current policy and practice in planning for housing supply in Northern Ireland and contrasts this with developments in England and Scotland. It utilises a mixed methodology with an emphasis on quantitative techniques to analyse a combination of Northern Ireland House Condition Survey data and data from Northern Ireland's Valuation List. The analysis, which culminates in two binary logistic regression models, illustrates the very complex inter-relationship between the underlying socio-economic and demographic factors, which, in combination with housing circumstances, play an important role in explaining inter-tenure differences in household migration patterns within Northern Ireland.

The rich dataset enables the study to examine not only migration patterns, but also the economic concept of spatial arbitrage that underpins functional HMAs and housing submarkets. The thesis concludes that given the important role that the private rented sector now plays in the housing market, inter-tenure differences in migration patterns are of sufficient significance to warrant the use of tenure-specific HMAs as the spatial framework for housing market analysis and planning for housing supply in the context of larger urban agglomerations such as Belfast.

List of Figures

List of Tables

Chapter 1 Introduction: Rationale and Context

1.1 Background

Housing plays a vital role in the economic and social fabric of any industrialised country. Northern Ireland is no exception to this rule. Indeed, in recent years the reciprocal interdependence between Northern Ireland's housing market and its economy – and, in particular, its labour market – have become stronger. The role of the housing market both in stimulating the Northern Ireland economy in the decade after the 1998 Agreement (1998-2007) and in hampering its recovery from the subsequent economic crisis – what became known as the Global Financial Crisis (GFC) of 2007/08 – is well documented (Gibb *et al.* 2007; Frey and Gray, 2010; NIHE, 2012). Maclennan and Gibb (1993) had noted that "until the 1990s there was, in Britain, relatively little detailed interest in the connections between the housing market and the national economy" (p.191). However, since then a wealth of academic research and policy documents have emerged that confirm the strength of these relationships not only in the UK but also internationally (Gibb and Marsh, 2014) and provide useful theoretical and practical insights for policy makers and practitioners involved in understanding housing market trends and guiding the future development of housing in Northern Ireland, i.e. planning for housing supply.

Since the beginning of the new millennium, there have been clear indications that the economic fundamentals of the UK's economy have undergone significant longer-term change. Compared to the latter decades of the twentieth century, the first two decades of this century have seen a UK economy characterised by lower rates of economic growth, more sluggish increases in productivity and wages, significantly higher levels of Government and household debt and historically low interest rates over a lengthy period of time (Bunn and Rostom, 2015; Stephens *et al*., 2018; ONS, 2020). Northern Ireland's economy, too, has undergone a major transition that in turn has been reflected in a re-structuring of the labour market, partly as a result of the substantial in-migration of workers and their families from Eastern Europe (O'Sullivan *et al*., 2014).

The re-structuring of the labour market, in combination with a changing demographic profile and in tandem with a significant shift in emphasis in terms of Government welfare and housing policy in the UK, have in turn had a significant impact on the structure of the housing market (Alcock, 2003; Mullins and Murie, 2006; Somerville and Sprigings, 2006; Gibb *et al*., 2007; Maclennan, 2010).

The most important impact in terms of the structure of the housing market in Northern Ireland, as in other parts of the UK, was the rapid growth in the number and proportion of privately rented dwellings during the first decade of the new millennium. This was driven on the demand side both by first time buyers who wished to enter the owner-occupied sector, but who faced growing affordability problems as house prices rose increasingly out of proportion to incomes, and by households on low incomes, households that in previous decades may well have entered the social sector (NIHE, 2013). On the supply side more relaxed lending criteria by financial institutions in the run-up to the GFC and the potential significant capital gains for investors over a short period of time encouraged a significant increase in supply, facilitated by the availability of buy-to-let mortgages, and exacerbated by the emergence of the "accidental" landlord (Kemp, 2004; Crook and Kemp, 2014). The combined effect of these demand and supply side factors driving the growth of the private rented sector was heightened by Government policy that increasingly favoured market solutions to housing issues and was reflected in significant reductions in central and local government funding for social housing (Hincks *et al*., 2013;Murie and Williams, 2015).

The rapid growth of the private rented sector in the first decade of the 21st century provides a key element of the context for this study that aims to improve the evidence base for the housing market analysis that underpins planning for housing supply in Northern Ireland. Essentially, the thesis examines how housing economics can contribute to a better understanding of the definition and delineation of housing markets – something that is fundamental to the process of planning for housing supply.

The research is grounded in the housing economics-based theoretical framework underpinning functionally based housing markets that in turn is predicated on the

intercausality of demography, labour markets and housing choice, and the importance of their combined influence on the structure of housing markets. Within this framework, the research critically examines current policy and practice in planning for housing supply in Northern Ireland – policy and practice which is either tenure neutral or focusses almost exclusively either on the owner-occupied sector or on the social sector. It argues that this focus on the owner-occupied and social sectors underplays the increasingly important role of the private rented sector in meeting housing need and demand and is therefore unable to provide the integrated, all-sided view of the housing market that is necessary for optimum policy and practice, particularly in the current economic climate. Evidence for the current policy and practice context is provided by a number of key documents, including: Northern Ireland's *Regional Development Strategy – RDS 2035 – Building a Better Future* (DRDNI, 2012) and the Department for Social Development's "*Building Sound Foundations: A Strategy for the Private Rented Sector*" (DSDNI, 2010), which emphasises the need for the private rented sector to play a bigger role in meeting housing need and demand, as well as reports initiating the process of Housing Market Analysis currently undertaken by the Northern Ireland Housing Executive (Young *et al.*, 2010; O'Sullivan *et al.*, 2011).

The research initially explores a large body of academic and policy literature that examines both the economic theory underpinning functionally defined housing markets and submarkets and its practical application in the methodologies used by planning authorities in the UK. This provides a theoretical and policy context for assessing to what extent planning for housing at the strategic level in Northern Ireland – and more specifically the tenure-neutral strategic spatial analysis that underpins the Regional Development's Housing Growth Indicators (HGIs) – should take into account the rapid growth in the private rented sector since the mid-2000s.

1.2 Rationale for the Research Study

The rationale for this thesis emerges from a number of sources. Firstly, the need to provide a robust evidence base to underpin Government policy in relation to meeting housing need and demand, and facilitating housing choice, continues to be of vital importance. Research undertaken by the Housing Executive into Northern Ireland's

housing market over a period of more than twenty years has highlighted awareness of the methodological challenges of providing a sound evidence base for housing market analysis in Northern Ireland. The process of data collection and analysis underpinning estimates of future housing requirements and more specifically the methodological debates surrounding both the development of HGIs for Northern Ireland, as well as the model used by the Housing Executive to estimate the need for social housing have been fraught with difficulties that have impacted on the evolution of sound evidence-based policies. All this has heightened awareness of both the limitations of prevailing Government methodologies to estimate future housing requirements and the potential of other, as yet under used, data sources that link housing, labour markets and demography (including migration) to contribute to improving this process.

Secondly, a significant body of academic and policy literature has been published on the subject in the context of Great Britain. This literature is predicated on an awareness of the significance of underlying economic factors in planning for housing as the basis for a practical understanding of the structure and dynamics of local housing systems (Maclennan and Tu, 1996; Watkins, 2001; Jones, 2002; O'Sullivan, 2003). This awareness has found its expression in the emergence of an approach to housing market analysis based on the definition and delineation of functionally based local housing markets and submarkets as the framework for a more meaningful strategic assessment of future housing (and housing land) requirements, at the local level. From the late 1990s onwards, this was reflected in Great Britain in a transition from more traditional Housing Needs Assessments to broader Housing Market Assessment/Analysis (Local Housing Systems Analysis in Scotland), a transition that has been taking place over the last fifteen years in Northern Ireland. (DCLG, 2007a; Scottish Government 2008a; Young *et al.*, 2010; Newhaven Research, 2018).

Finally, a major structural change in Northern Ireland's housing market has taken place since the late 1990s. The distinguishing feature of this process of change has been the steady (and sometimes rapid) growth in the private rented sector, driven to a large extent by an investor boom predicated on rapid capital appreciation (Gibb *et al*., 2007), and resulting in a concomitant substantial increase in the number of

migratory moves by private tenants. This in turn raises significant conceptual issues in relation to the delineation of functionally based housing markets that are based essentially on the patterns of migration of owner-occupiers (Jones, 2002; Jones *et al*., 2005). The current *Housing Strategy for Northern Ireland* (DfCNI, 2015) indicates that the private rented sector will play an increasing role in meeting the housing requirements of a growing number of households in Northern Ireland, something that in turn has significant implications for the methodological approach to assessing Northern Ireland's future housing need and demand. However, so far at least, the academic literature on the private rented sector in Northern Ireland has not addressed this issue, but has focussed on, for example, its growth and dependency on Housing Benefit (Frey and Gray, 2010) or on the impact of welfare reform on the sector (Beatty *et al.*, 2014; NIHE, 2018).

This thesis addresses this gap by providing new insights into the dynamics of Northern Ireland's housing market during a period characterised by a substantial growth in the private rented sector. In doing so it attempts to make a contribution to improving the conceptual understanding of housing markets and submarkets, and more specifically the role of the growing private rented sector in these markets, with a view to enhancing the approach to planning for housing supply in an organisational context that is now increasingly dominated by Northern Ireland's 11 local Councils.

1.3 Aim and Objectives

Based on the above rationale, this thesis has the following overarching aim:

To critically examine the methodologies used by Government to plan for future housing supply in Northern Ireland – specifically the spatial framework for Housing Market Analysis – in the context of rapid growth of the private rented sector.

The following five interlinked objectives encapsulate the key tasks required to meet the overall aim:

1. *To evaluate the theoretical framework for Housing Market Analysis in the light of significant changes in the structure of Northern Ireland's housing market.*

2. *To evaluate the policy context and current spatial framework for estimating future housing requirements and supply in Northern Ireland in the light of the changing tenure composition of the housing market.*

3. *To explore how the socio-demographic and socio-economic characteristics and housing circumstances of migrant households impact on the household migration patterns that underlie the delineation of functional housing markets.*

4. *To examine the extent to which the theoretical foundations of functional housing markets* (*spatial arbitrage and migration self-containment*) *are applicable to the private rented sector.*

5. *To explore the extent to which patterns of housing choice and household migration patterns are different for owner-occupiers and private tenants in the context of Northern Ireland and whether such differences are sufficient to challenge theory and practice in relation to the definition and delineation of the spatial framework for Housing Market Analysis.*

1.4 Methodological Overview

Social research methodologies have traditionally been categorised into two broad approaches: quantitative and qualitative. Each is underpinned by a specific epistemological and ontological position and both are associated with a variety of related techniques for data collection and analysis.

Quantitative research, as the term indicates, focuses on collecting and analysing numeric data, but is in reality much broader than this. It is closely associated with a deductive approach to the relationship between theory and data that is typical of the philosophical position underlying research undertaken in the natural sciences (positivism) and views social phenomena as having an existence that is independent of social norms.

Qualitative research on the other hand focuses on the collection and analysis of non-numerical data. It is underpinned by an interpretivist epistemological position that emphasises the views of research participants and a constructionist ontology that views society as a product of human activity rather than as something with a separate

existence. It harnesses the inductive approach to the interaction between theory and research that draws on individual interpretations of the social world of which they are a part.

While not rejecting the traditional methodological dichotomy, this thesis is predicated on the view that in reality the differences between qualitative and quantitative research can be exaggerated to the detriment of a more holistic approach that facilitates a deeper understanding of the social world. Chapter 4 elaborates in much more detail on these methodological considerations but concludes that in the last analysis this study is best guided by the view that "no method of research, quantitative or qualitative, is intrinsically better than any other" (Silverman, 2005:6) and that the methodological approach adopted should primarily reflect the research issues being addressed and the realities of undertaking the research.

Taking cognisance of this advice, this thesis adopts a hybrid, mixed methods approach as the optimum way forward to address a central hypothesis that examines the housing economics based theoretical positions underpinning the spatial framework for estimating future housing supply in Northern Ireland during a period of considerable economic uncertainty and rapid growth in the private rented sector (2006-2011). On the one hand, the methodology reflects the quantitative approach (testing existing theory / hypotheses by analysing data from three successive Northern Ireland House Condition Surveys[1]. On the other hand, it also draws on elements of the qualitative approach, by making use of a much wider range of variables and open-ended responses from individual households to inform a more in-depth and explanatory analysis of the household migration patterns that underpin the delineation of Northern Ireland's functionally defined housing market areas (HMAs). In doing so it also sheds light on the economic theory and propositions underpinning functional HMAs and the extent to which they are relevant to the migratory patterns of private tenants.

[1] The NIHCS is undertaken on a regular basis by the Northern Ireland Housing Executive. The datasets analysed in this thesis were based on the surveys carried out in 2006, 2009 and 2011 (NIHE, 2008, 2011, 2013).

1.5 Dissertation Structure

This introductory chapter has provided a brief contextual and methodological overview of the thesis that unfolds with the following structure (Figure 1.1):

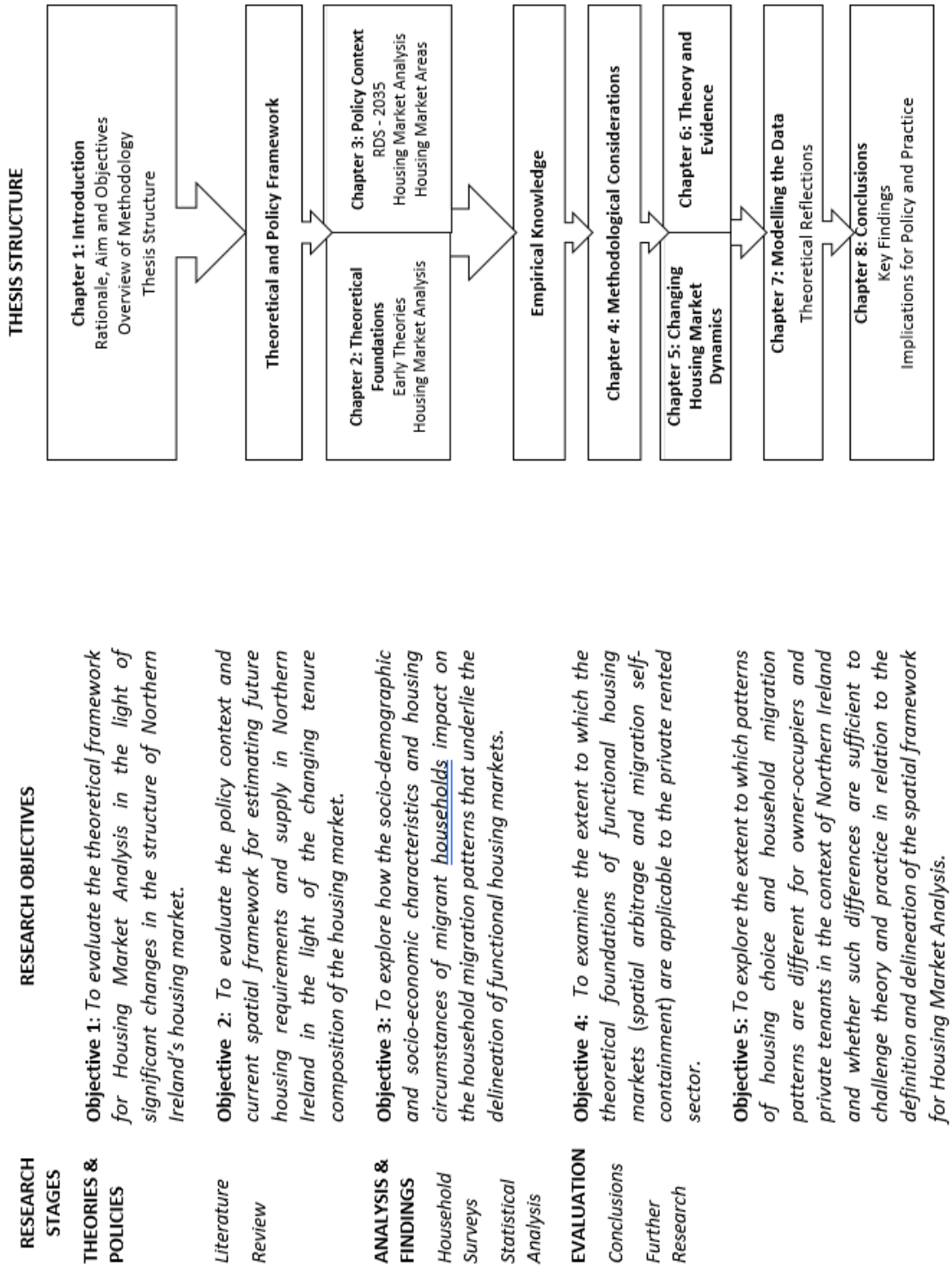


Figure 1-1: Research Stages, Research Objectives and Thesis Structure

Chapter 2 has two main parts. The first of these explores the academic literature on the neo-classical economics-based theories that underpin contemporary housing market analysis and highlights the important role that commuting, migration and house price formation play in these theories. This multi-dimensional theoretical framework provides the basis for the second part of the chapter that provides a more detailed review of the methodologies used to operationalise these economic-based theories in the context of the definition and delineation of functionally defined housing markets.

Chapter 3 begins by outlining the emergence of evidence-based policy and planning and the transition from the process pf housing needs assessment to the analysis of functionally based housing market areas that took place in Great Britain from the late 1990s onwards. This provides a comparative context for examining the key strategic documents that provide the policy context for planning for housing supply in Northern Ireland and, in particular the spatial framework for estimates of future housing requirements and supply in Northern Ireland. It also provides an overview of the changing structure of Northern Ireland's housing market between 2001 and 2011 that was characterised by the rapid growth of the private rented sector, emphasising the key role played by Government policy in accelerating this change.

Chapter 4 addresses a range of methodological considerations and sets out the epistemological and ontological positions that underpin the research strategy and design adopted by this thesis. It also examines in some detail the datasets extracted from the 2006, 2009 and 2011 House Condition Surveys, which provide much of the empirical data on which the analysis in subsequent chapters is based.

Chapter 5 provides a descriptive statistics based analysis that highlights key differences in the socio-demographic and socio-economic profiles and housing circumstances of owner occupiers and private tenants that could result in substantive inter-tenure differences in internal migration patterns.

Chapter 6 analyses the dataset in more detail in the context of the theoretical debate on housing markets and submarkets. It compares and contrasts the socio-

demographic and socio-economic characteristics and migration patterns of households in the private rented and owner-occupied sectors in relation to their propensity to cross housing market and submarket boundaries in an attempt to ascertain to what extent these patterns are in harmony with a theoretical framework based on the concepts of spatial arbitrage and migration self-containment.

Chapter 7 uses two logistic regression models to bring together a number of key demographic and socio-economic variables that Chapter 6 has demonstrated play a significant role in determining household migration patterns. The models provide a unifying framework for understanding the interactions of these variables and their relative importance in explaining inter-tenure differences in the housing circumstances and migratory patterns of owner occupiers and private tenants and an evidence base for reflecting on the extent to which the model outcomes resonate with the theoretical propositions that emerged from the literature review in Chapter 2 of the study.

The concluding chapter re-visits the overarching aim and objectives of the study and the research proposition that has guided it. It provides an assessment of the extent to which each of the five key objectives of the study have been addressed. It also highlights a number of key conclusions and the implications for policy and practice in relation to determining the spatial framework for housing market analysis and planning for housing supply in the context of Northern Ireland.

Chapter 2 Theoretical Foundations

2.1 Introduction

Chapter 1 outlined the structure and content of the thesis. It set the broad context: the growing interdependence of the housing market and the UK economy, the importance of the reciprocal triangular relationship between the labour market, demography and the housing market and the rapid growth of the private rented sector in the 2000s. It also set out the rationale for the research: in particular the ongoing need for an evidence-based approach to public policy and the growing awareness of the importance of understanding the dynamics of housing markets in order to have a meaningful strategic planning framework for the identification of housing requirements at the local level. The introductory chapter also noted that the study is grounded in theoretical frameworks that were developed by housing economists to underpin the definition and delineation of housing markets in functional terms. It highlighted the growing importance of the private rented sector in policy terms going forward and the necessity, therefore, of giving the sector more weight in housing market analysis. Chapter 1 also presented the overall aim of the thesis – to provide a critical evaluation of the spatial framework underlying methodologies used to determine future housing supply in Northern Ireland – before concluding with an outline structure of the remainder of the thesis.

Chapter 2 forms the first pillar of the theoretical and policy framework that underpins the overall study (Figure 2.1). It addresses primarily Objective 1:

> *To evaluate the theoretical framework for Housing Market Analysis in the light of significant changes in the structure of Northern Ireland's housing market.*

It achieves this by exploring a voluminous and diverse academic literature that provides a range of insights into the triangular relationship between residential location, migration and employment that lies at the heart of the theoretical framework underpinning contemporary housing market analysis. The chapter is divided into two main parts. The first part (Section 2.2) outlines and evaluates the neo-classical economics-based theories of urban spatial structures that provide the ultimate theoretical foundation for functionally defined housing markets. It

highlights the processes of commuting, migration and house price formation that emerge from this theoretical framework and underpin the operationalisation of these theories in the context of housing market analysis. This multi-dimensional framework provides the basis for the chapter's second main part (Section 2.3) that undertakes a more detailed examination of the academic literature on housing market analysis. It focuses on how the journey to work, household migration and hedonic pricing have been used in real world settings as the basis for establishing a spatial framework for the analysis of functional housing markets and submarkets. Chapter 2 concludes by setting out a research proposition that guides the remainder of the thesis.

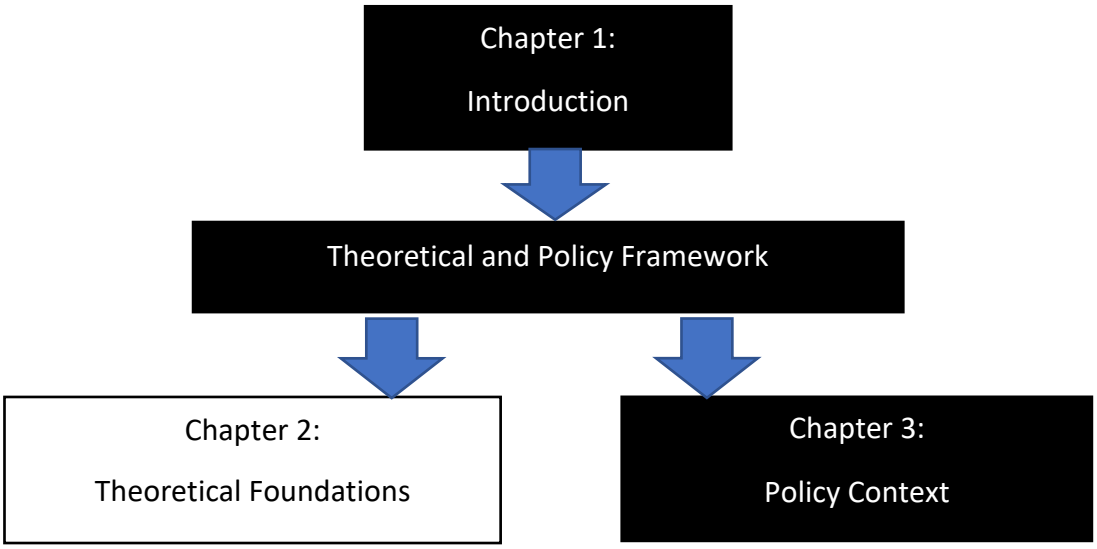


Figure 2-1: Chapter 2 in its structural context

2.2 Urban Housing Models

There is an extensive and varied literature on urban housing models and a variety of approaches that can be attributed, in part at least, to the complexity of the commodity 'housing' (Quigley, 1979; Gibb, 2003). This complexity reflects its heterogeneity, durability, locational fixity and adaptability (Galster, 1996), as well as the fact that housing combines asset, investment and consumption dimensions (O'Sullivan and Gibb, 2003). Indeed, it is the interaction of these key characteristics of housing as a commodity that makes the economic analysis of housing markets so challenging (Quigley, 1979). However, the models that are of particular relevance to

the theoretical framework underpinning modern housing market analysis are the neo-classical trade-off models (often referred to as access-space models), urban housing models driven by the process of 'filtering' and hedonic pricing models used to identify housing submarkets.

2.2.1 Access-space models

Quigley (1979) notes that many of the most important early insights into the operation of housing markets were based on the observation that when a household purchases or rents a dwelling it simultaneously purchases a certain level of accessibility to place of work. Indeed, Maclennan (1982) specifically identifies the roots of the access-space model in the emerging discipline of urban economics that had this necessary trade-off between 'rent' (or purchase price) and 'travel costs' as one of its major focal points and the recognition that the size of a dwelling plot (and analogously dwelling size) was an important factor in determining household satisfaction.

In this sense, therefore, early neo-classical models of residential location were based on the premise that as distance from the city centre increased land prices fell, while travel to work costs increased (bid-rent theory). The trade-off for households on a given income between more access and less space (or vice versa) was the foundation for the original and indeed simplest version of the access-space model developed by Alonso (1964). This model envisaged that economic factors at work in the housing/land market would produce a structure of concentric rings around a Central Business District (CBD) brought about by variations in household incomes and access-space preferences. It was developed by Alonso in the "rapidly expanding and laissez faire context of North American cities" (Maclennan, 1982:3) and further developed and refined by Muth (1969) with reference to Chicago and by Evans (1973), drawing on evidence from cities in Britain and can be seen as "the real starting point for an analysis of local urban housing markets" (Maclennan, 1982:7). Indeed Gibb (2003), having examined a range of academic literature on urban economics and urban real estate concluded that the access-space model has continued to be the "dominant paradigm" of urban economic research in North America.

As with all such simplified models of reality, the residential patterns that emerge from the access-space model are highly dependent on the assumptions underpinning it. Maclennan (1982) outlines three broad sets of assumptions that are as summarised below:

(1) *Assumed spatial structure*: a flat, undeveloped featureless plain on which a central business district (CBD) develops and where all the residents of the town or city are employed. The transport system emanates from the CBD in a uniform radial pattern. Locations that are equidistant from the CBD are equally accessible, but the average speed of travel increases with distance from the centre.

(2) *Behavioural assumptions*: developers involved in land transactions and in housing supply are assumed to be profit maximising and operate in the context of a perfectly competitive land market. The economic behaviour of a household can be viewed through a neo-classical lens with its role as a consumer being seen as that of a 'utility maximising price taker'. The assumption of fully informed profit maximising developers and utility maximising consumer households together with market structures based on open competition means that the model can be developed deductively, leading to mathematically determined equilibrium solutions.

In addition, Maclennan (1982) notes that the utility function ascribed to the household can encompass varying degrees of complexity. The general assumptions that underpin the mix of household preferences and constraints in the model view housing as a complex commodity, which, when combined with other factors such as the time spent travelling to work, gives rise to a flow of housing services. In one of the simpler versions of the model (Evans, 1973), the utility function (U) takes the form:

$$U = U(q, t, w, a_i) \qquad \text{(Equation 1)}$$

where q is the number of space units consumed by the household; t is the time spent travelling from home to the workplace in the CBD; w is the number of hours worked; a_i (i = 1,2,…n) are other household activities.

This version of the utility function (U) implies that housing is a very simple commodity. Each address is seen as providing merely a specific location (and therefore a certain travel time to the CBD) and a quantity of space units. The household utility function is maximised subject to two constraints. Firstly, resources (including wage rates, cost of travel and cost per hour of household activities) whereby it is fundamental to the model that the price of a unit of space is a function of travel time or distance from the urban centre. Secondly, the geographical separation between a household's place of residence and place of work means that time (an economic opportunity cost to the commuter) has to be spent travelling between the two locations. This is reflected in the utility equation, where travel time (t) becomes a negative factor and an overall constraining time budget is imposed, comprising the number of hours worked (w) and the sum of a_i ($\sum a_i$) where a_i is the time spent pursuing the ith activity and $\breve{T}$ the total time available in the chosen period:

$$\breve{T} = w + t + \sum a_i \qquad \text{(Equation 2)}$$

This economic formulation of the 'residential location problem' can then be used to show that the "spatial structure of the city and its associated movement system will produce a regular pattern of land values and residential supply prices, which are brought into equilibrium with a set of spatially defined price offers for different locations and lot sizes by consumers" (Maclennan, 1982:10).

(1) *Consumer utility maximisation and bid-price functions*: Maclennan (1982), drawing on the work of Evans (1973), shows how the utility maximisation problem (constrained by time and resources) is solved "to provide a statement of the equilibrium location and travel time choice for the household" (ibid.). From this insight it is possible to determine the shape of the household bid-rent function, i.e. the relationship between travel time (home to place of work) and the optimum rent/price for a given bundle of

> housing services. The amount of residential space consumed will vary with distance from the CBD and its cost will reduce as distance from the urban centre increases. Maclennan emphasises that the relationships between time, distance and speed of travel assumed in the model developed by Evans are "reasonably rooted in empirical reality" (ibid.:12).

The access-space model also provides some insights into the supply of housing and how housing density and land values vary in an urban setting. In examining the issue from the suppliers' point of view, Evans' model makes two basic assumptions: that profit-maximising developers are faced with paying for land at a given ground rent or sale price and that there is a given price for housing space units. Given these assumptions, developers will choose to develop at a density where their marginal development costs equal their marginal revenues. Evans uses the relationship between the price of land and developers costs and profits to indicate that higher rents prevail nearer the central urban area, and that both density of development and land value gradients will decline at decreasing rates away from the city centre. Despite this, Maclennan (1982) notes that there is a lack of empirical evidence for Evans' argument that the total costs of development increase, but at a decreasing rate, with rising density. From the point of view of the individual household the equilibrium location and level of housing resources can be ascertained by superimposing the household bid-rent function (the demand side of the model) on the downward sloping rent gradient (the supply side).

Gibb (2003) provides a somewhat different perspective on the supply side of the access-model by focussing more on households rather than developers. The production of housing can be perceived as involving two capital inputs, namely land and a 'composite housing structure'. The housing element is assumed to be perfectly elastic with regard to location. In the simplest versions of the access-space model, density is fixed. However, in more sophisticated versions, housing density varies by means of the elasticity of substitution, so that in areas of higher density closer to the urban centre, non-land is increasingly substituted for land, a tendency that is reversed as housing spreads towards the urban periphery. In a competitive market the price of land / rents rise through a bidding process with the highest prices / rents

closest to the CBD. Households or developers bid for land in different locations on the basis of a utility-based or profit-based trade-off that results in them locating on the same 'iso-utility' or 'iso-profit function', thus creating a land gradient for the urban area as a whole. In an equilibrium situation, households, who have to accept the prevailing price for land / housing ('price-takers') position themselves "at a tangency between the land rent gradient and their best (lowest) 'bid-rent' or marginal willingness-to-pay curve" (Gibb, 2003:25), i.e. in an optimal position that reflects the importance that space and travel time play in their lives. If the model is modified to take account of different levels of household income and if it is further assumed that households with higher incomes exhibit an income elasticity with regard to their demand for housing space that is greater than the price elasticity of commuting costs, then households with higher incomes will gravitate towards the suburbs.

The principal conclusions of the monocentric access-space model can be summarised as follows: "(1) residential densities decline with distance from the central place; (2) densities decline at a decreasing rate; (3) house prices decline with distance; (4) the land price gradient is steeper than the house price gradient; (5) households with higher incomes locate further from the central place" (Quigley, 1979:394).

The theoretical basis for the access-space model has been extensively criticised by a significant number of urban economists for a variety of reasons. Two of the most comprehensive critiques of the monocentric model are provided by Anas *et al.* (1998) and by Maclennan (1982).

Anas *et al.* (1998) begin by examining the model in terms of its ability to explain the evolution of modern urban spatial structures. Drawing on urban economics, they focus on the process of decentralisation that has led to polycentric structures becoming increasingly prevalent. Multiple employment 'sub-centres', each exerting an influence on residential patterns, have become commonplace. Some are incorporated as older settlements into an expanding conurbation, others develop as 'edge cities' (Garreau, 1991) around transportation intersections as at a considerable distance from the urban centre.

Anas *et al.* (1998) see significant advances in transportation technology as providing the historical context for the process of decentralisation of American cities. In the late nineteenth century, the electric streetcar facilitated 'streetcar suburbs'. However, it was particularly the advent of the internal combustion engine and the telephone in the first half of the twentieth century that enabled businesses to relocate to the suburbs, with a gradual increase in car ownership enabling the areas between the streetcar suburbs to be settled and the overall urban area to expand. In the latter half of the twentieth century, inter-city road haulage and the growth of inter-city highways enabled manufacturing to leapfrog to the outer suburbs with CBDs increasingly becoming office and service centres. The 'edge cities', characterised by large concentrations of office and retail space and underpinned by universal automobile access exemplify the most recent phase of urban development.

Based on this historical context, Anas *et al.* (1998) argue that Alonso's monocentric model – in which land use decisions are essentially driven by the trade-off between the desire for space and commuting costs – is much too simplistic. More realistic versions of the model take account of congestion, air pollution, neighbourhood quality and economies of agglomeration. However, a more fundamental limitation of the model is that it is static: either the model envisages a stationary state with permanently durable housing, or it envisages a short-term equilibrium with unfit housing being continuously replaced by new buildings. Neither are considered realistic, because in the real world the life expectancy of housing is typically much longer than the period of time over which the basic parameters of the model could be expected to remain unchanged.

Nevertheless, Anas *et al.* (1998) do concede that the model does provide useful insights into the twin process of population decentralisation and suburbanisation. Empirical evidence from a large number of cities lends support to the basic conclusions of Alonso's model. Population densities decline with distance from the CBD and the density gradient (the proportional rate at which population density declines with distance) has declined over time. Urban economists tend to explain decentralisation by reference to the combination of rising incomes and declining transport costs, both of which cause the density gradient to decline in the

monocentric access-space model. However, Anas *et al.* (1998) are not entirely satisfied with the second part of the explanation because the largest part of transportation costs is user time, which tends to rise in value as incomes rise, in effect creating a countervailing force to the impact of improved travel speed. In addition, it has been difficult to isolate the effects of transport costs empirically, not only because of the strong correlation with incomes, but also, for example, because much of the analysis has had to be based on gross density data (rather than net density, which excludes non-residential land). This has resulted in a tendency to overestimate the size of the density gradient because suburbs tend to contain more undeveloped land (Anas *et al*., 1998).

For Anas *et al.*, however, the biggest weakness of the model in terms of its ability to explain urban decentralisation is its failure to take account of the durability of housing. Drawing on Harrison and Kain (1974), Anas *et al.* note that cities tend to grow outwards at a density reflecting the prevailing economic conditions with the density of earlier rings remaining unchanged due to housing durability. In addition, citing Mieszkowski and Smith (1991), the empirical evidence for Houston indicates that the density of developed residential land remains approximately constant throughout the entire urban area. Both empirical studies lead Anas *et al.* to conclude that explanations for observed density gradients are much more complex than envisaged by the access-space model, including variations on 'flight from blight', such as deteriorating housing quality in the more central areas, 'racial preferences' and the negative neighbourhood externalities often associated with neighbourhoods containing concentrations of households on low incomes.

Maclennan (1982) also provides a useful critique of what he terms a 'highly deductive approach'. Empirical evidence from cities in the United States and Britain on residential spatial structures, population densities, the relationship between household income and dwelling location and the land value curves all suggest that patterns in the real world do tend to reflect the outcomes envisaged theoretically by the model. However, Maclennan, like Quigley (1979), views this as a "weak and indirect test of the model"; it could be argued that a whole range of other factors help create spatial patterns that correlate with distance from a city centre. Anas *et*

al. (1998), for example, cites racial patterns, neighbourhood quality, the age of the housing stock and employment opportunities in peripheral locations as potentially significant factors.

Maclennan (1982) is also critical of three of the main assumptions underpinning the model, arguing that:

(1) It oversimplifies the nature of housing as a commodity by focusing on space units and CBD-home location. However, this criticism can be overstated as other attributes only gain significance in markets in disequilibrium and once commodity complexity and household activity patterns are included in the model its predictive capacity declines.
(2) The underlying trade-off between a central workplace and suburban living that underpins the spatial structure generated by the model are no longer dominant factors in modern cities where centres of employment are usually decentralised.
(3) The assumption that producers and consumers of housing have access to the comprehensive housing market information required to make the rational trade-off decisions and that there is an ongoing re-establishment of instantaneous market equilibrium in consequence of these decisions is clearly unrealistic in the real world where markets are often segmented and subject to differing degree of disequilibrium. Maclennan sees this latter assumption as the most unsatisfactory of the three.

Gibb (2003) is also critical of the model, highlighting not only unrealistic assumptions (for example, that employment is concentrated in the Central Business District), but also their conceptual failings. Indeed Gibb emphasises that “urban market choices do not only rely on workplace accessibility and locational amenity, but also reflect choices to do with neighbourhoods, housing product differentiation, the pervasive role of the state in the land market, urban transport structures and local fiscal bundles” (Gibb, 2003:27) and concludes that the significant influence that policy and

history play in urban housing systems cannot really be understood in the context of the access-space model.

Urban economists have addressed these model weaknesses to a greater or lesser extent in extensions to the model that modify its underlying assumptions (Straszheim, 1987; Gibb, 2003). Alonso (1964) himself recognised that to more accurately reflect empirical evidence from the real world the model had to be modified. The final chapter of his book, for example, focuses on the impacts of zoning, and recognises that planning regulations represent "a potential modification of the free-market situation" (Alonso, 1964:117). However, despite the weaknesses of the model – and the additional criticism that it is unsuitable for analysing short run market phenomena such as the demand for housing (Gibb, 2003), Maclennan (1982:21) accepts that "there is no real competing theory to the access-space model" when it comes to the "long run spatial economic structure of an urban housing market". Anas *et al.* (1998:10) also accept that the model has proved its worth because it "provides a rigorous framework for analysing the spatial aspects of the general-equilibrium adjustments that take place in cities".

Despite the criticisms directed at the unrealistic assumptions and the oversimplified causal relationships at the heart of the access-space model, there is sufficient empirical evidence to suggest that it reflects a substantial core of neo-classical economics-based truth. For a model to be useful scientifically, it must abstract from a complex real world. The resulting simplification of reality may then be successively modified to reflect and explain actual processes and phenomena more accurately. In recognition of this, many academic papers that examine the theoretical foundations of housing market analysis in its modern context pay tribute to the access-space model originally developed by Alonso (Jones, 2002, Hincks and Baker, 2012; Jones *et al.*, 2012) – specifically because its central tenet (the distance decay function from the CBD) has significant validity for defining functionally-based housing markets. The journey to work, and its impact on residential location decisions, plays an important role in shaping local housing markets and their boundaries can be viewed as reflecting the furthest distances commuting employees are prepared to travel between their home and a dominant employment centre.

2.2.2 Filtering models

The inability of the access-space model to provide a sufficiently explanatory theoretical framework for examining short-term developments in housing markets makes it unsuitable for some important aspects of housing market analysis, such as the demand for housing. Housing market analysis recognises that in the real world housing markets are very segmented and characterised by varying degrees of disequilibrium, rather than the overall equilibrium envisaged by the access-space model. In undertaking applied studies, therefore, urban economists have often made use of 'filtering models' which implicitly recognise the existence of housing submarkets (Maclennan, 1982). Filtering models focus on the dynamics of housing markets and, in particular, on the interrelationship between new and second hand markets and the movement of households between them. In contrast to the access-space model, which implicitly assumes that the housing market adjusts smoothly following dwelling purchase, filtering models focus on vacancy chains and the process of succession, through which households can move upwards and downwards in the market, and where neighbourhoods can experience decline and ultimately abandonment, or, conversely, can experience regeneration – developments that reflect both the process of filtering and its ultimate outcome.

Homer Hoyt (1939) is generally considered to have undertaken the seminal study that utilised a filtering framework (Gibb, 2003). Hoyt used empirical data on changing land values and household migration across 38 cities in the USA to develop a simple model based on household succession that resulted in an urban spatial configuration characterised by residential sectors rather than the concentric rings associated with the access-space model. This sectoral spatial structure evolved as a consequence of the following process: in the early stages of urban development, households with the greatest wealth and influence did not constitute a group that was large enough to occupy an entire urban residential ring. They therefore congregated in a distinct sector near the urban centre. In Hoyt's model, this sector effectively became a reference point for lower income households, who – it was assumed – would want to live in proximity to their peer group. Based on a further assumption (a static urban

economy), a rent gradient would initially radiate out from the sector occupied by the dominant household group. Over time, as the city developed and the urban economy expanded, new housing developments would spring up on the edges of the urban area. The increasing wealth of higher income households, together with an endogenous preference for more modern, newly built homes would result in this peer group migrating to the suburbs (a factor that resonates with one of the central tenets of the access-space model – the trade off between journey to work and housing amenity). The older homes vacated by these wealthier households would be sold at prices that had been reduced sufficiently to enable households in the next highest income bracket to purchase and occupy them. This in turn resulted in a further set of vacancies for households on even lower incomes, generating a domino effect that cascaded downwards to lower income households. Ultimately, households on the lowest incomes would move out of the poorest quality homes leaving behind decaying and abandoned neighbourhoods that could then be redeveloped.

Maclennan (1982) notes that in Hoyt's inductive model, 'filtering' refers to both the "observed pattern of movement and the specific process underlying the movement outcome" (p.23) and is based on a whole range of assumptions relating to households as consumers of housing as well as the urban housing system. These assumptions include the following:

> (1) new housing is built at the periphery of urban areas and aimed at higher income groups whose wealth is growing;
>
> (2) income growth enables the pursuit of an inherent preference for 'newness', 'status' and more space;
>
> (3) changes in the overall distribution of household incomes and demographic profiles do not constitute part of Hoyt's model, but it assumes that wealthier households experience income growth;
>
> (4) lower income groups prefer proximity to their peer group; and,

(5) reductions in the price of a unit of housing services bring about an upward movement in the housing market that is not constrained by transfer costs.

Maclennan (1982) notes that subsequent analyses of urban housing markets did not seek to subject Hoyt's theory to the normal scientific process of empirical confirmation and, where appropriate, theoretical revision. Instead, there was, on the one hand, severe criticism of the potential policy implications of the model and, on the other, a conceptual response (Grigsby, 1963) that provided a framework for empirical studies of the migration of households across the urban housing stock and subsequently further technical refinements of this framework.

In policy terms, Hoyt's model was perceived as suggesting that providing new private housing for higher income households in the suburbs would lead to an overall improvement in the quality of housing and that these new developments should therefore be encouraged via subsidies to developers and/or consumers. Smith (1970) highlighted the possibility that Hoyt's employers (the Federal Home Administration in the USA) might use the model as a framework for a housing policy that would in effect subsidise the development of new homes for households on higher incomes in suburban locations. The subsequent 'filtering' process would then have the dual effect of raising the quality and lowering the price of housing for all households. The equality implications of this, however, were open to criticism. Not only would subsidies be directed to higher incomes groups, they would also in effect re-inforce distributional inequalities by maintaining the existing relative wealth distribution between societal groups. In addition, the policy could be perceived as encouraging suburbanisation.

Maclennan (1982), however, notes that these ethics-based criticisms are directed at a central plank of housing policy rather than the theoretical basis for Hoyt's model and that filtering models have influenced housing policy for decades, if only implicitly. Indeed, Lowry (1960) suggests that urban housing policy had been 'haunted' by the filtering model.

Pertinently, one of the key problems of evaluating the filtering model is the lack of an accepted definition of 'filtering' (Maclennan, 1982; Galster, 1996; Gibb, 2003).

Hoyt's model had focussed on household movement and the consequent changes in property prices. Lowry (1960) had noted the importance of non-moving households and argued that it was property values that 'filter' as relative house prices moved upwards or downwards and that this can take place without household migration, while Smith (1970) suggested that filtering took place when property values declined more rapidly than housing quality.

Grigsby (1963), however, set out a more thorough conceptual evaluation of 'filtering' based on an analysis of the relationships between houses, households and household migration. Grigsby developed a matrix-based model based on observed household moves across housing of varying quality and price. Maclennan (1982) views this work as being critical to the development of housing market dynamics (a position that is borne out today by the central position that this triangular relationship plays in modern housing market analysis) and summarises Grigsby's analysis under three headings:

(1) *Filtering as outcome*: it views filtering as an observed outcome. The pattern of filtering can be examined empirically using a matrix of household moves between homes that differ in terms of quality and price.

(2) *Filtering 'up' and 'down'*: the corollary of (1) is that both households and neighbourhoods may filter up or down the housing quality/house price range.

(3) *Filtering through submarkets*: Grigsby's defines a submarket as an area containing houses that are close substitutes for one another. Maclennan is critical of this definition in that it could imply the existence of a unitary housing market in which slightly different 'products' are sold, and suggests a better definition that sees submarkets defined on the basis of "the price of a unit of housing service varied across space or quality sub-groups" (Maclennan, 1982:26).

Maclennan (1982) is equally critical of research undertaken in the USA (Schnare and Struyk, 1976) and in the UK (Kirwan and Ball, 1977) that failed to find empirical evidence of the existence of submarkets in particular cities. Research undertaken in Glasgow and Edinburgh (Maclennan, 1982) showed that within these two cities small areas with a relatively stable housing stock could display very different rates of house price increase over both shorter and longer periods of time, suggesting that it was reasonable to assume that submarkets did exist. Indeed, since the early 1980s, a considerable number of studies of cities in the UK and other countries, based mainly on hedonic analysis, have demonstrated the existence of submarkets (Adair *et al.*, 1996; Berry et *al.*, 2003; Watkins, 2001; Jones *et al*., 2004; O'Sullivan *et al.*, 2011).

In examining Grigsby's model in the context of 'filtering', it is important to note that there is a significant difference in the underlying mechanism driving this model compared to Hoyt's original model. In Hoyt's model the key driver of change was the supply of new housing in the suburbs to satisfy an exogenous demand for 'newness' from wealthier households with rising incomes. In contrast, Grigsby's model takes a wider view of 'filtering' and sees the process of household movement and the resultant urban residential patterns as the outcome of a range of factors of housing finance, supply and demand, including population change, building new houses, demolitions, gentrification and housing renewal programmes (Grigsby, 1963; Maclenna, 1982).

Maclennan (1982) points out that Grigsby did not undertake a detailed analysis of the driving forces underlying intra-urban household migration, a shortcoming that Maclennan addresses by examining four economic drivers of urban housing markets (income growth, population change, tastes and preferences and supply factors) and the potential (and sometimes contradictory) household migration patterns that may arise in consequence.

Income growth: Hoyt's model requires wealthier households to experience an increase in their incomes or there to be a fall in the price of new dwellings in order for the filtering process to commence. Maclennan, however, views the implicit assumption that income growth is limited to the peer group as 'peculiar' and postulates a number of other combinations of income growth and house price

change that could lead to different patterns of household movement. In particular, it is possible to envisage that there is a significant change in the relative distribution of income across all socio-economic groups, with the result that pressures may build up in locations (submarkets) that become accessible to households lower down the socio-economic spectrum, who have benefited from more rapidly rising incomes.

In passing, McLennan is also critical of Smith's definition of filtering (where the price of dwellings decline more rapidly than their structural quality) that excludes the potential impact of rising incomes on both household mobility and the relative value of homes in specific neighbourhoods.

Population change: population growth, even if there is no change in individual household incomes or income distribution can have a significant impact on the structure of housing demand. Rapid growth, even without a change in overall demographic structure, may interfere with the process of filtering by significantly increasing the price of dwellings within one submarket relative to another. For example, the demand for, and therefore the price of, a particular type of entry-level dwelling could rise significantly, a development that could be compounded by supply side lags. Changes in demographic structure, and specifically those related to turning points in household life cycle and income[2], can alter relative prices, particularly where there are marked discontinuities between submarkets in terms of price and quality. First-time buyers in the UK, for example, have traditionally bought flats/apartments or terraced houses. If the rate of new household formation rises there would be increasing demand for this type of property, reflected in rising prices in neighbourhoods where there are concentrations of this type of dwelling. Maclennan (1982) notes that this 'outward and upward push thesis' is at variance with Hoyt's concept of filtering (p.29).

Tastes and preferences: Hoyt's model implicitly assumes that the desire of wealthier households for 'newness' is not income elastic, whereas in contrast the demand for space units for all income groups is income elastic. In addition, there is an inherent

[2] A point that resonates with the work undertaken by Clark and Huang (2003) who emphasise the importance of life cycle events in triggering household migration.

preference for particular groups to reside beside, or apart from, certain other groups. In the real world, however, neighbourhood choice is a much more indeterminate process. To illustrate the point Maclennan (1982) notes the process of gentrification that has taken place for a number of decades in cities in the UK and USA – where higher income households return to inner city neighbourhoods to refurbish sub-standard dwellings and in doing so increase overall house prices in that area – substantiating the proposition that older, upgraded, well-maintained properties can satisfy the preferences of higher income groups attracted to city-centre living. The assumptions of Hoyt's model in relation to the preference for 'newness' – while not disputing the market premium that new properties still command – may "have had a sound inductive base for the periods and places analysed", but cannot be considered to "have universal relevance and thus… will have limited detailed application" (Maclennan, 1982:30).

Supply factors: Filtering models do correctly highlight the importance of supply side considerations, and in particular the primary role that the provision of new dwellings plays in driving the filtering process. In the real world, however, vacancies do not only arise as a result of the knock-on effects of new build. Life cycle effects and/or income growth can create divergent rates of vacancy across different submarkets. However, Maclennan concedes on the basis of filtering studies carried out in the UK that there is evidence to indicate that newly built dwellings command a relatively higher price. They do tend to be occupied by higher income groups and vacancies create chains of dwellings that tend to be back-filled by lower income households, though not inevitably so (Jones, 1978). Evidence from Edinburgh (Richardson *et al*., 1975) indicates changes in property prices tend to conform to Hoyt's model, partly at least because Edinburgh's transport system was being improved and it was experiencing urban growth and suburbanisation similar to the cities studied by Hoyt. However, the evidence from Glasgow in the 1970s (Dawson *et al.*, 1980) did not find similar substantiating evidence. The supply side generalisations of filtering models should therefore not be seen as ubiquitously valid. In the UK, new housing was increasingly provided at the lower end of the market – initially in the social sector, but in more recent years in the private rented sector with a significant number of first time buyers

buying new properties – often with the help of equity sharing / shared ownership schemes. The drive towards inner city regeneration has meant that new properties are by no means necessarily associated with suburban locations and that rundown neighbourhoods can be 'recycled' back up the hierarchy of desirability.

Maclennan (1982) summarises his comprehensive critique of filtering models by emphasising that there is a 'complex set of factors which determines household movement, turnover and area ranking (in terms of price)'. In Maclennan's view, therefore, the concept of filtering as a process does not satisfactorily explain urban development and that "different dynamic processes can, over space and time, underlie movement patterns" (Maclennan, 1982:31). He is more positive about the potential of Grigsby's concept of filtering as a housing market outcome, but bemoans the fact that this concept had led to a more technical rather than theoretical focus, and in consequence had not stimulated the research needed in order to more fully understand the reality of housing market dynamics.

In concluding, Maclennan anticipates the burgeoning academic literature on housing market analysis that emerged in the 1990s by citing Davies (1978), who once again focusses on filtering as a process – but has a much broader view of what is involved in the process. According to this interpretation of 'filtering' "the real housing consumption of families or households changes over time, whether by the depreciation or renovation of the same dwelling unit or the choice of a different dwelling unit… The process may involve changes in real incomes and in the relative price of housing services" (Davies, 1978:139). As Maclennan correctly observes, this "effectively equates filtering and housing market dynamics" (Maclennan, 1982:32).

More recently Galster (1996) and Gibb (2003) provide further useful insights into the concept of 'filtering' and its relevance for understanding urban housing markets. Both, however, like Maclennan, emphasise the lack of clarity surrounding the definition of filtering. Galster (1996) identifies two broad approaches: the first of these deals with the life-cycles of dwellings (changes in their market prices, their quality or in the incomes of the households living in them); the second approach focuses on the life cycle processes of the households (changes in housing quality resulting from increasing or decreasing house prices and/or incomes). Whichever

focus is adopted, however, any filtering-based analysis of urban housing markets necessitates their sub-division into 'distinct segments', i.e. submarkets.

Galster (1996) illustrates his argument by citing four academic contributions to the concept of filtering. Firstly, he provides a somewhat different focus from Maclennan to the work undertaken by Grigsby (1963). Galster states that Grigsby's partitioning of the housing stock was based on "degrees of household substitutability" – dwellings were grouped for analysis purposes based on patterns of household mobility. Mobility, in turn, was identified as driving changes in dwelling price and consequently structure as well. Grigsby's resulting matrix related characteristics of recent home purchasers to their dwellings, thus providing a theoretical framework for subsequent research on the relationship between house prices and the construction of new dwellings or the maintenance/refurbishment of existing ones.

Secondly, Galster summarised the filtering model framework provided by Smith (1964). This framework was premised on a simple algorithm that assigned households to dwellings with a view to assessing the impact of the construction of new dwellings. Smith subdivided the housing stock into five archetypes of differing quality and postulated that new homes would be constructed when the 'economic value function' (the aggregate value of rents resulting from the introduction of a new dwelling) exceeded the 'cost function' at the quality level where the excess occurred. Deterioration of the stock progressively lowered the cost function to a point where replacement took place, while increases in incomes and/or population drove up the value function, thereby leading to new construction and (in the case of higher incomes) leading to vacancies in the poorest quality sector. Maclennan (1982) had already criticised Smith's approach for its restrictive definition of filtering: in situations where dwelling price is reducing faster than structural quality. Galster, while crediting Smith with providing additional insights into household behaviour, is critical of him for overlooking endogenous price changes in the five archetypal quality levels, and how these changes influenced household movements and the rate of deterioration of existing homes. In addition, Galster notes that Smith's model is insufficiently dynamic because it assumed that the overall number of dwellings was constant and that household formation was unaffected by house prices.

Thirdly, a model developed by Sweeney (1974) and subsequently modified by both Braid (1981) and Schall (1981) attempted to address the shortcomings of the Smith model. These models assumed all dwellings were perfect substitutes within each level of the housing hierarchy, and that cross-price elasticities of demand were positive between adjacent levels and that prices were directly related to a hierarchical rank. Demand for a dwelling in a particular hierarchical group was a function of preference and incomes and prices in other levels. The rate of stock deterioration was seen as varying proportionally to the number of dwellings at a particular level and inversely with the average time that a household occupied a dwelling at that level. In this framework, therefore, supply and length of tenure were considered to be key determinants of a household's maintenance expenditure. Most significantly for the concept of filtering, the authors of these models were able to demonstrate theoretically that new construction may or may not reduce the real price of housing at lower-quality levels depending both on the quality levels at which the construction of new homes occurs and the demand and supply elasticities in the 'target' and lower levels. Galster (1996:1801) comments that while these models "offer a provocative and robust formulation of housing market transactions …. Some key results depend on extremely strong and unrealistic assumptions".

The final filtering model reviewed by Galster (1996) examined the work of Rothenberg *et al.* (1991). This model provides a framework that highlights the interrelationships between the main elements of filtering (changes in house prices, household movement between dwellings of differing qualities, and changes in dwelling quality) and the circumstances that can lead to such changes in a housing market characterised by submarkets defined on the basis of housing quality. Equilibrium market valuations for each of the submarkets are based on medium-term demand and supply estimates and change when these factors change. Therefore, when house prices in a given submarket fall (for example, in response to the construction of new dwellings) households from a lower quality submarket may move into this higher quality submarket (*price filtering*). However, for some households, who might have moved to a higher quality submarket, falling relative prices may encourage them to remain where they are and improve the quality of

their dwelling (dwelling filtering). Such supply adjustments tend to lead to higher house prices in origin submarkets and lower house prices in destination submarkets. Over a longer period these medium-term demand and supply responses in a particular submarket can trigger knock-on 'filtering-like' repercussions in similar submarkets: house price adjustments, household moves and home improvements. "The adjustments thus spread throughout the submarket complex in successively dampened degree with increasing dissimilarity of submarket quality level" (Galster, 1996, p.1802).

In essence, therefore, filtering models focus on the process and dynamics of the housing market. In Hoyt's original model, the 'filtering' process (by which a dwelling's attributes and occupants change over its lifetime) is seen as being triggered by rising incomes and an underlying preference for newer properties, with wealthier households moving to newly developed suburbs, stimulating a trickle-down effect, whereby other households move up the housing ladder and the overall quality of housing improves. This overly simplistic model has been comprehensively criticised for its underlying assumptions, for the lack of definitional clarity surrounding the concept and for its policy implications in terms of raising overall housing quality.

Nevertheless, as with the access-space model, there is empirical evidence that supports the concept of 'filtering', as both a process and an outcome. Grigsby's emphasis on the reciprocal interrelationship between dwellings, households and household movements in the context of an urban housing market was a major step forward on the road to contemporary housing market analysis. Galster's main conclusion based on his examination of filtering models was that urban housing markets must be viewed as a system of inter-related submarkets, with changes in one submarket impacting on other submarkets with a magnitude that is inversely related to the degree of difference in inter-submarket quality. This again highlights a fundamental element of modern housing market analysis – the interdependence of its component parts. It is no accident that in recent years many of the academic papers examining housing markets and submarkets pay tribute to the concept of filtering. Gibb (2003) sees it as providing an important tool for housing market

research. Jones *et al.* (2004:270) characterise it as a "first attempt to consider the nature of market processes" and as having played a significant role in the development of the concept of a housing submarket. The concept of 'filtering' has also provided important theoretical insights for the computer-based simulation models and hedonic analyses of urban housing markets that have played such an important role in housing market analysis and housing policy formulation in the UK since the beginning of the new millennium.

2.2.3 Hedonic Models

Sections 2.2.1 and 2.2.2 have examined two of the most important theoretical concepts and associated models of urban development that provide fundamental insights into the economic foundations of modern housing market analysis. However, the academic literature indicates that there are other related approaches to modelling urban structure that are also of importance. Hedonic modelling, in particular, has played a very significant role in identifying housing submarkets. Hedonic pricing models emerged in the late 1980s from being "a cutting-edge empirical curiosity to a standard method of price index construction" (Malpezzi, 2003:67) and since then have been widely used by urban economists as a basis for analysing housing markets. The ultimate basis for hedonic house price models is the heterogeneity of both housing and consumers, allowing expenditure on housing to be broken down into measurable prices and quantities so that the market price and/or rent for different types of dwellings or for similar dwellings at different locations can be compared (Malpezzi, 2003).

A hedonic model "postulates a market containing a heterogeneous housing stock, which can only be modified at some cost, and heterogeneous consumers, some of whom put different valuations on a given bundle of characteristics ('house') than others" (Gibb, 2003:73). This approach to modelling housing markets has its origins in two academic papers that are regularly cited by housing economists in the introductory sections of their hedonic analyses.

The first of these (Lancaster, 1966) puts forward a new micro-economic approach to understanding consumer behaviour in which goods are no longer viewed as 'direct

objects of utility': utility is not generated by the goods themselves, but by the properties or characteristics of the goods. Consumers are assumed to prioritise the characteristics of goods and therefore only rank the goods indirectly. Goods, as in the case of housing, normally possess more than one characteristic and often multiple characteristics will be the same for different goods. Lancaster developed this approach by examining a wide range of commodity groups, including consumer durables, financial assets and leisure. Its application to housing was not specifically addressed but given the inherent multi-dimensional nature of the housing commodity its relevance is self-evident.

The second article (Rosen, 1974) that is often cited in hedonic studies of the housing market also take the heterogeneous nature of commodities as its point of departure. However, this article focuses less on the utility bearing nature of a commodity's attributes and more on how suppliers and consumers interact within the framework of 'competitive equilibrium', and in doing so was the first to present a theory of hedonic pricing (Xiao, 2017). The total price of a commodity can be viewed as the sum of the implicit (hedonic) prices of each of its attributes. In an equilibrium market, therefore, the price of a particular commodity (such as a dwelling) can be regressed on its individual characteristics to determine the extent to which the characteristic contributes to the overall market price. Rosen's model comprises two separate stages. The first stage provides an estimate of the marginal price for each attribute by regressing the price of a commodity on its attributes. The second stage estimates the inverse demand curve or marginal willingness to pay function derived from the implicit price function calculated in stage one (Leung *et al*. 2002).

Since the early 1970s, the seminal papers by Lancaster and Rosen have laid the theoretical foundations for the numerous hedonic model based studies that estimate implicit prices and demand functions for individual dwelling characteristics, studies that have often formed an integral part of housing demand analysis (Maclennan, 1982). In its simplest form, a hedonic index uses an equation based on a regression of housing expenditure on dwelling characteristics. Malpezzi (2003), for example, characterises hedonic equations as essentially regressions of house price or rent against the dwelling characteristics that determine its price or rent. Independent

variables in the equations represent selected dwelling characteristics and the regression coefficients provide the basis for estimating the implicit prices (hedonic prices) of these characteristics.

Malpezzi puts forward a basic equation that reflects the multi-dimensional nature of housing and the composite consumer demand for its various attributes:

$$R = f(S, N, L, C, T) \qquad \text{(Equation 3)}$$

where R = rent or house price; S = structural characteristics; N = neighbourhood characteristics; L = location; C = contract conditions (e.g. whether utilities are included in the rent); and, T = timeline rent or dwelling price is observed. Other models group the dwelling characteristics in a somewhat different way, but most identify locational, neighbourhood and internal (structural) attributes as the key headings ('vectors').

The hedonic technique can be applied to any dwelling characteristic that differentiates houses in the eyes of potential buyers (or tenants). Where the availability of these characteristics varies spatially across a housing market then the interaction of supply and individual preferences can affect the pattern of house prices (Freeman, 1979). Hedonic indices can thus reveal the implicit prices of particular dwelling attributes. Following Maclennan (1982) the estimation of this type of attribute demand function usually involves a two-stage procedure.

In the first stage regression analysis is used to estimate the implicit prices of individual dwelling characteristics by relating the prices of a sample of properties in a particular housing market to individual dwelling characteristics to reveal the hedonic price function. Where there are variations in house prices and dwelling characteristics a marginal price schedule can be derived for any of the chosen characteristics. Differentiating the hedonic price function for any individual characteristic reveals the implicit price function for that particular characteristic. The price function is considered implicit as it is only revealed indirectly by what house buyers (or tenants) are willing to pay for additional quantity (or quality) of a particular characteristic. The hedonic price function can be linear or non-linear in terms of form. In its simple linear formulation there is the assumption that the implicit price of a

characteristic is constant for all individual consumers and all levels of consumption. A non-linear formulation, on the other hand, may indicate, for example, an assumption of diminishing marginal utility from additional consumption of the characteristics.

In the second stage of the process, the implicit prices of the individual characteristics are differentiated in terms of actual consumer choice, thus revealing a marginal willingness to pay for a particular attribute. The technique assumes that the housing consumer is a price taker and "maximises utility by moving along each marginal price schedule until marginal willingness to pay for each attribute is equal to its marginal implicit price" (Maclennan, 1982:43)

There is little disagreement among housing economists about the validity of the overall concept of hedonic modelling. It is widely recognised that housing is a multi-dimensional commodity and that the demand for housing can therefore be seen as a flow of services emanating from a 'bundle of attributes' with implicit prices rather than from a unit of the commodity as a whole. However, both the identification of attributes and the measurement of their implicit prices are problematic and the methodology can be regarded as having major limitations (Maclennan, 1982).

Malpezzi's (2003) critique of hedonic models distinguishes between theoretical (conceptual) issues and more practical specification issues. With regard to the former, housing economists are faced with a classic problem of disentangling the effects of supply and demand when analysing datasets (e.g. house prices) that obviously reflect both. This 'identification' problem is compounded in more complex non-linear hedonic models, where individual consumers are no longer simply 'price-takers' and effectively choose both a quantity of a particular housing attribute as well as its implicit price (Sheppard, 1999).

The second major theoretical issue that arises and is addressed by a number of housing economists is the hedonic model's assumption that the housing market is in equilibrium, when in fact the costly nature of housing market adjustment processes clearly indicate that this is not the case (Malpezzi, 2003). Maclennan (1982) highlights market complexity, infrequency of purchase and transaction costs as key factors

affecting consumer behaviour in a housing market in disequilibrium and suggests that as a result the application of hedonic techniques may not always be appropriate.

These two theoretical issues are conflated by examining the potential impact of housing supply on hedonic models. The inherent characteristics of the housing commodity (its durability, multi-dimensional nature and its spatial fixity) encourage segmentation of the market and therefore a greater likelihood of disequilibrium. This disequilibrium is further compounded by the inelastic nature of housing supply in particular locations and by the assumption of perfect information on the part of buyers and the search costs that they incur. In such cases observed prices are unlikely to reflect equilibrium values and may reflect a demand price, a supply price or a price that differs from both. “A naive ‘attribute regression’ ignores this problem and disallows any supply side influence” (Maclennan, 1982:46).

Hedonic modelling is also beset by more practical specification issues with little guidance on the subject from economic theory (Malpezzi, 2003). An examination of the relevant academic literature reveals an abundance of discursive commentary on the selection of relevant variables, on what functional form to use and on how best to define the geography of a particular housing market and its submarkets.

Original work by Adair *et al.* (1996) emphasises the importance of both identifying variables and measuring them in an appropriate format if the resulting hedonic models are to have practical merit and provide the basis for housing market segmentation. The selection of the dependent variable (house price or rent) is usually straightforward, although data quality can be an issue, particularly in the case of estimates provided by owners. However, the selection of the independent variables determining the chosen dependent variable is beset with problems. Misspecification is a common problem, whereby irrelevant variables may be included (over-specification) or conversely relevant ones may be excluded (under-specification) (Chau and Chin, 2003). Butler (1982) suggests that since all hedonic price models are misspecified to some extent it is advantageous to keep the number of identified variables to a minimum, but in the last analysis variable selection is often simply determined by what is readily available from existing datasets.

Typical structural independent variables include floor area, number of rooms or bedrooms, dwelling form or structure, age and heating type. Independent neighbourhood variables may include an overall rating, an assessment of the quality of schools and leisure amenities and the incidence of crime, while locational variables often include access to public transport or accessibility of CBD or other significant employment centres, health services and schools (Adair *et al.*, 2000; Gibbons and Mackin, 2008). However, it is difficult to know what really differentiates housing from the consumer's point of view and researchers using best-fit hedonic regression as a means to address this are confronted by other problems such as the collinearity of the independent variables and spatial autocorrelation (Xiao, 2017). Hedonic models can also be criticised for not adequately incorporating changes in attribute quality. These more specific concerns as well as more general ones regarding underlying assumptions of market equilibrium and the ability of consumers to take optimal decisions in a complex market, and "a suspicion that supply and submarket conditions are seldom appropriately controlled for" has led Maclennan to take a somewhat "sceptical view of received estimates of income and price elasticities" (Maclennan, 1982:47).

The choice of functional form is as important as data quality and the selection of variables. There is agreement that poor specification of functional form may result in inconsistent estimates (Goodman, 1998; Goodman and Thibodeau, 2003) or bias in the regression equation (Fleming and Nellis, 1985; Adair *et al.*, 1996), but there appears to be no real theoretical basis for saying that one functional form provides clear advantages over another. Housing economists have used a variety of forms, including linear, log-linear (semi-log) and log-log[3]. Follain and Malpezzi (1980), for example, recommended using a log-linear function in preference to linear, primarily on the basis of simplicity (resultant coefficients reflect the percentage change in dwelling price or rent given a unit change in a particular variable) and because it allows for variation in the price of any particular attribute (a price that varies depending on the other attributes of the dwelling). Halvorsen and Pollakowski (1981)

[3] The semi-log model is based on transformation of the dependent variable (price), while in the log-log model both the price and a key independent variable such as floor area is transformed to a logarithmic scale (Adair *et al.*, 1996).

argue that because economic theory cannot provide a clear indication of the most appropriate functional form it is advisable to make use of the flexibility of the Box-Cox functional form that incorporates a number of functional forms for hedonic modelling and utilise a goodness-of-fit test to determine the optimum one. However, other research studies indicate that this flexibility brings with it a number of downsides, including considerable complexity and a reduction in the accuracy of any single coefficient and therefore a less accurate hedonic price (Cassel and Mendelsohn, 1985).

Although hedonic price studies do not need to assume a segmented housing market, there is general agreement that markets are not uniform and housing market segmentation is the rule rather than the exception (Adair *at al.*, 1996; Chau and Chin, 2003; Xiao, 2017). Most studies that set out to define the geographical boundaries of housing submarkets use some form of hedonic modelling as their basic methodology. The hedonic regressions that form the core of the analysis take the form of:

$$Y = a + b1X1 + b2X2 + b3X3\ldots \qquad \text{(Equation 4)}$$

Where X1, X2, etc. are the dwelling characteristics and b1, b2, etc are the implicit prices. For the model to work in the context of submarket identification, it is assumed that implicit prices are equilibrium prices, i.e. that supply equals demand for each of the chosen dwelling attributes. To identify submarkets, the model is applied to different geographic areas to see if equilibrium prices in submarket A are significantly different from equilibrium prices in submarket B. Submarket identification using hedonic analysis is therefore a process of looking for significant differences in implicit attribute prices for single or groups of characteristics of dwellings in geographically defined areas.

The statistical test originally developed by Schnare and Struyk (1976) to establish whether differences in implicit attribute prices are statistically significant dominates the academic literature (Jones *et al*., 2005). This uses a three-stage procedure to establish significant price differentials for a standardised dwelling in different submarkets. Firstly, hedonic price functions are established for each potential submarket. Secondly, a Chow test is computed to establish significance of difference

in standardised dwelling in each of the submarkets. Thirdly, the total standard error is calculated for the submarket model and compared with the standard error for the wider market as a whole and acts as a 'common sense' test of price differentials for a standardised dwelling between submarkets. Jones *et al*. (2005) emphasise that the requirement for detailed data on the sale of individual dwellings, including dwelling and neighbourhood characteristics as well as actual sale price is often demanding in terms of resources.

However, again the absence of a solid theoretical basis for selecting and measuring the chosen dwelling attributes as well as the functional form must be regarded as a major limitation (Tu, 2003). To work empirically, the hedonic approach has to, firstly, identify all the relevant characteristics (and have appropriate data to capture them); secondly, identify the optimal functional form of the relationship between dwelling price/rent and the corresponding attributes; and, thirdly, identify *ex ante* the geographic areas that confirm or refute the submarket hypothesis. If there are errors in any of these factors the technique is to a greater or lesser extent compromised.

In practice, therefore, the results obtained may be sub-optimal and often rely primarily on data that is readily available, but not without its own disadvantages. Many studies have used geographical or administrative boundaries or socio-demographic characteristics to define submarkets, but there still appears to be little consensus on how best to define housing submarkets in practice (Xiao, 2017). However, it is important to note that too broad a definition can lead to biased estimates due to inappropriately aggregated samples (Linneman, 1980), whereas, conversely, too narrow a definition can lead to inaccurate estimates because some key data may be excluded.

In conclusion, there is no doubt that both the theoretical basis and the operational application of hedonic modelling can be roundly criticised. Despite this, however, both the concept and its application to urban economics have stood the test of time, and this is reflected in the large number of studies undertaken worldwide that utilise hedonic modelling as their theoretical framework. Malpezzi (2003) notes that the process of successfully developing a hedonic model specification in terms of the independent variables selected, its functional form and it terms of defining

submarkets is both an art and science. In the last analysis, therefore, the skill of the researchers in applying the theory in an optimal manner, given available resources and data, must be seen as the critical success factor in determining the usefulness of any hedonic study. This thesis will return to the issue of submarket definition later in this chapter as part of the critical examination of modern housing market analysis.

2.2.4 Computer housing market simulation models

The numerous and increasingly complex hedonic models that have for many years provided useful insights into the dynamics and structure of cities throughout the world have made full use of the very significant increase in the processing power of computers that has taken place over the last four decades. Increasingly powerful computers have more recently also facilitated the development of computer simulation models, which recognise the complexity of housing markets in the real world and the interdependence of their component parts. These models "embody elements of both trade-off and filtering models… and have been shown to be potentially useful tools for policy development and planning purposes" (Gibb, 2003:36).

In a sense, therefore computer simulation models of the housing market play a different role to the three models examined in the previous sections in that they could be considered more of a tool rather than an economics-based theory of urban spatial structure. Nevertheless, given both the inability of any of these three models to provide a comprehensive urban housing model and the importance of the systems approach to understanding the dynamics of housing markets, simulation models must be viewed as an important element of the theoretical foundations of modern housing market analysis and the systems approach that underpins it.

Computer simulation models "use parameter values for equations based on a mix of econometrics, good practice and judgement, to build more or less sophisticated urban housing models" (Gibb, 2003:30). At the heart of these simulation models are statistical algorithms that drive forecasts of the process of urban development over time. In turn, the models provide a framework within which it is possible to consider the trajectory of the housing market in the short term and have been used not only

to provide a deeper understanding of the dynamics of housing markets, but also, by modifying key variables, to assess the impact of proposed policy changes on one or more of their component parts.

In contrast to the Alonso model or the hedonic models, which are underpinned by the assumption of a longer-term equilibrium market, simulation models focus on the shorter-term dynamics of market processes. Gibb (2003) notes that they initially emerged in the United States in the 1970s to assess the impact of housing allowance programmes and other tax reforms, and exemplified by the UI (Urban Institute) Model and the National Bureau (NBER-HUDS) model. Both these models were designed to simulate the process of households accessing dwellings under specific supply side assumptions and incorporated elements of the access-space and filtering theories. In the UI model, for example, households are differentiated on the basis of age and race and allocated dwellings of different types across six zones, each with different levels of rent and workplace accessibility. Housing supply is set at a level that maximises profits for developers, while households are assumed to maximise utility in a process that envisages equilibrium in the market for both new and existing dwellings. Choice and profit/utility maximising behaviour in the context of a longer-term equilibrium framework are characteristic of these early simulation models and have been criticised for having parameters that are not economically defined, but are typically ad hoc and chosen to ensure realistic model outcomes (Smith *et al.*, 1988).

However, Gibb (1989) views this criticism of lack of theoretical purity as too simplistic in the light of the different role that simulation models play in terms of policy development. Simulation models have not only occupied a central position in the process of land use planning, but highlight the complexity of urban housing development, the significance of change over time and the interdependency of the choices made by economic agents. From a policy point of view, indeed, they address the 'narrowness of the urban neo-classical paradigm' and their parameters are typically derived from 'best-practice econometrics' (Gibb, 1989:31).

Urban housing simulation models developed more recently by Anas and Arnott have a more robust theoretical foundation (Gibb, 2003). Their discrete choice equilibrium model of the housing market was designed to assess the impact of specific housing

policies and allocates different types of households to a range of dwelling categories in a framework that includes an integrated supply side and assumes market clearance (Anas and Arnott, 1991)[4]. They develop their approach further, initially in the context of Chicago, in a simulation model that focuses on the choices made by households in terms of location, dwelling type, housing quality and tenure. The Chicago model demonstrates the primary and secondary effects of specific policies on different sectors of the housing market defined in terms of quality and on the households living in them (Anas and Arnott, 1993). In 1994, the approach was developed in four other US cities with the specific aim of examining the relative effectiveness of demand side allowances to households and supply side subsidies to developers for meeting the housing needs of selected household groups (Anas and Arnott, 1994).

Gibb (2003) provides an overview of the outcome of an early application of this type of simulation model in the UK – one that was developed to forecast the demand for social housing in Greater Glasgow. The model divides Greater Glasgow into three sectors (North, South and suburbs) and involves tenure choice between owner occupancy and social renting (Gibb *et al.*, 2000). The model was designed to provide estimates of the demand for social housing in the light of a range of assumptions about, for example, migration and income levels. It built on work carried out in London and South-East England (Meen and Andrew, 1999) and takes account of the economic choices facing households as well as wider economic factors influencing demand, including regional migration. It provides a realistic model of housing choice that suggests household decisions to move house are related to demography and income, and that choice of tenure and location reflect neighbourhood quality, income, cost and previous location. The study provided a number of important policy signals; for example, that improving neighbourhood quality in the City of Glasgow would lead to a significant increase in levels of owner occupancy in more central neighbourhoods – largely due to existing owner occupiers migrating from the suburbs into the City. However, Gibb admits that there are also important weaknesses with the model. In particular, its (somewhat mechanistic) supply-side is

[4] Seminal work by DiPasquale and Wheaton (1994) casts doubt on the assumption of rapid market clearance.

under-developed and there is only an implicit residual role for the private rented sector, which is subsumed within the owner-occupied sector for the purposes of forecasting.

Gibb (2003) regarded the Glasgow citywide model as the first serious attempt to develop a simulation model of the entire housing system (including explicitly social housing) for a metropolitan area in the UK. However, since then there have been a number of complex models of housing supply and demand that have been developed with the specific purpose of shaping Government policy and practice in the UK. Perhaps the best known of these models, and the subject of most debate has been the CLG-Reading Affordability Model (Meen, 2011; Bramley, 2013) that was commissioned by central Government (ODPM, DCLG) to provide a policy analysis tool that could be used to provide advice on appropriate housing supply targets to regional planning bodies. The context for the development of this model was the early 2000s, when a combination of economic and demographic growth and a perceived unresponsiveness on the part of the housebuilding industry was viewed as the key driver of rapidly increasing house prices and the growing affordability problem (Bramley, 2013). Between 1971 and 2001, real house prices in the UK had increased annually at an average rate of 2.4 per cent, compared to a European average of only 1.1. per cent (Meen, 2011).

These developments found their most intense expression in London and South-East England and provided the context for what became known as the Barker *Review of Housing Supply* (Barker, 2004). This review undertook a comprehensive assessment of housing supply and demand from an essentially economic perspective by focussing on the concept of 'affordability' rather than the demographically driven 'predict and provide' approach that had hitherto dominated Government commissioned work on housing need and demand (Bramley, 2013). The Barker Review highlighted the planning system as the main cause of the undersupply of housing and recommended that Government should focus on achieving affordable housing targets, i.e. outcomes that were sensitive to the wider economy and, in particular labour market conditions. In policy terms, the importance of economic factors in the planning for housing process were explicitly recognised in the final report. A key recommendation was for

Government to focus on market affordability goals that are determined using a methodology that emphasises the importance of market signals and are supported by other measures such as a Planning Gain Supplement to capture development gains (which had traditionally accrued to landowners following planning permission) for the benefit of the wider community (Barker, 2004).

In response to the Barker Review, the Government-commissioned CLG-Reading model was designed to address the following question: "if a given amount of housing is built in a region over time, what level of house prices result" (Bramley, 2013:18). It was essentially a spreadsheet-based simulation model for each of the nine regions of England that produced forecasts of 'affordability' (defined as the ratio of lower quartile prices to lower quartile earnings) over a period of 25 years. The overall model comprised a number of component models, including aggregated regional economic models calibrated on time series data (house prices and migration) and others based on household surveys (labour market status, earnings and household formation). The underlying determinants of house prices were real incomes, housing stock relative to the number of households, mortgage interest rate and house prices in adjoining regions.

The model is designed on the basis that given the price and income elasticities of demand incorporated into the algorithms underpinning it, if real incomes rise for a proportion of households then housing supply must increase to maintain a particular level of affordability. Meen (2011) notes that planning policy has historically tried to estimate future requirement for new housing based on the expected increase in the number of households. However, because the income elasticity of housing demand (approximately 2.0) is significantly higher than its price elasticity (Meen and Andrew, 2008) unless housing supply increases more quickly than household formation, affordability will worsen over time (NHPAU, 2007).

Perhaps the most significant finding of the CLG-Reading model in policy terms is its view that the affordability issue cannot realistically be addressed solely by increasing supply. The model demonstrates that while affordability does respond to increased supply, it only does so by means of a lengthy adjustment process. In the 2009 version of the model, for example, increasing supply from around 200,000 to 290,000 per

annum (its high supply scenario) only reduces the affordability ratio by 0.12 (1.5 per cent) by 2016 and 0.86 (9.1 per cent) by 2031 (Bramley, 2013:21). In addition, the model predicts that even with the high supply option the absolute level of the affordability ratio will continue to rise above the historic levels seen in the mid-2000s, a feature of the model that reflects the high elasticity of house prices to incomes built into it (Meen and Andrew, 2008). “Large increases in construction produce modest improvements in affordability” but “even larger increases are required to bring real price growth to the European average” (Meen, 2011: 1093)

A very similar model was developed for Scottish Government (Leishman *et al.*, 2008) in the context of a less-pressured Scottish market. The model operates at a lower geographical scale (at the sub-regional level) but the headline findings were in keeping with those for England. It estimated that if annual housing supply was increased from 25,000 to 35,000 (40%), the house price to income ratio would fall from 6.8 per cent to 6.2 per cent (9%). (Interestingly, and in contrast to the English model, Bramley (2013) noted that the Scottish model estimated that the price and affordability effects would be smaller in sub-regions such as Edinburgh and Aberdeen where housing supply and demand imbalances were most apparent).

Bramley (2013) highlights a number of challenges faced by researchers using this type of complex simulation model to influence planning policy in relation to housing supply. It could be argued that the models show that even if planning guidelines were significantly eased in order to increase supply, the positive effects in terms of affordability are limited and beyond realistic political horizons. The models also provide clear indications that demand side factors are more important than supply in determining house prices and that in policy terms it is more important to focus on affordable housing rather than overall supply.

A Northern Ireland model based on the work by Leishman *et al*. (2008) attempted to address some of these issues, in particular, by including a specific policy driven Low Cost Home Ownership module. However, the complexity of the model and its somewhat ‘black box’ approach militated against its acceptance by decision makers in the policy and planning world. More generally, data weaknesses (in particular for the private rented sector), the challenges of disaggregation to local housing markets

and inherent model weaknesses such as the prediction of negative vacancies (Bramley, 2013), all militate against the successful adoption of this kind of complex simulation model in the real policy and planning world.

2.3 Housing Market Analysis

Sections 2.2.1-2.2.3 of this chapter have provided an overview and critique of the three main economics-based theoretical pillars of modern housing market analysis and highlighted their contribution to this complex process: the access-space model (the journey to work and the distance decay curve), filtering models (the importance of household migration and the interconnection between submarkets) and hedonic modelling (market segmentation on the basis of significant differences in implicit [equilibrium] prices – housing submarkets). In addition, section 2.2.4 highlighted the role of econometrics-based simulation models that provided both a theoretical contribution to housing market analysis and served as a tool to address the complexity and interconnectivity that characterises housing markets.

This part of the chapter (Section 2.3) looks specifically at the academic literature that underpins the emergence of modern housing market analysis. It begins by briefly examining the concept of a housing system, before turning to the academic literature on the definition and delineation of housing markets and the importance of this for more meaningful estimates of future housing requirements and supply. The third subsection attempts to summarise a much more extensive body of literature on housing submarkets and examines its role in providing planners with a basis for a more meaningful analysis of housing market dynamics and the basis for local housing needs assessments.

2.3.1 Housing systems

The realisation that in order to understand the dynamics of any housing market it is important to view it as a 'system' is nothing new. Murie *et al.* (1976), in their seminal work on the British housing system, recognised the importance of viewing any housing market as a series of interconnected and interdependent parts. They emphasised that "a fuller understanding of the 'parts' is unlikely without a better appreciation of their interrelationships" and that as well as contributing to a greater

understanding of how housing systems work it is of crucial importance for policy (p.35). The authors identify tenure as the most significant criterion for the primary disaggregation of the housing system but emphasise that tenure distinctions are not absolute and that there are limitations to static descriptions. For Murie *et al.* (1976) the need to understand the dynamic factors at work within the housing system make the study of household movement an imperative, a process which clarifies the links between the 'parts of the system'.

In a much more recent contribution to the academic literature Ferrari (2011) applies these theoretical principles in his conceptualisation of social housing within the wider housing market. Ferrari's paper notes the rise in interest in the microstructures of housing markets as a way of understanding housing's relationship to the wider economy and calls for multi-layered studies of the internal structure and operation of different parts of the housing system from different perspectives. However, the focus of Ferrari's paper is on the mobility of households in the social sector and the outcomes from a vacancy chain model of the social housing sector in the city of Bradford (UK) that enables analysis of both intra-sector mobility and movements between social housing and the other sectors of the housing system.

Ferrari's contribution to the more recent academic literature on housing market analysis is his successful construction of a framework for collating and integrating evidence from different parts of the housing system that constitutes an exemplar of the whole systems approach to understanding housing markets as advocated by Murie *et al*. (1996). The paper highlights the central role played by household mobility in the analysis of housing market dynamics by outlining a conceptual housing system comprising distinct but inter-related parts within which residential mobility both within and between these parts is of prime analytical importance. Ferrari (2011) also notes in passing that "the focus of most scholars' recent interest appears to have been the private housing market, perhaps understandably given the market's absolute size and its importance to wider economic and social policy" (p.95). Indeed, he correctly highlights the fact that much of the focus on mobility in understanding housing markets has been specifically "through the lens of owner-occupied housing" (p.97), driven by pragmatic limitations posed by data availability for other tenures.

The study paper analyses administrative datasets for Bradford to demonstrate the valuable contribution that vacancy chain models can make to understanding local housing systems and residential mobility as well as the evaluation of planning policy that determines the supply of housing.

Ferrari (2011) rightly concludes that an analysis of the social sector cannot be meaningful if it is isolated from the wider housing market and rightly reinforces the case for emphasising the importance of residential mobility to understanding the dynamics of the social sector and its links to the wider housing market. This is equally applicable to the private rented sector – a sector, which, as the following examination of the most relevant literature will show, has been somewhat neglected with regard to the concept and delineation of housing market areas. However, the focus on understanding the drivers of residential mobility does echo an important facet of the two key early models (the access-space model and the 'filtering' model, see sections 2.2.1 and 2.2.2) of urban spatial structure that provide much of the original theoretical foundation for functionally defined housing markets.

2.3.2 Defining Housing Market Areas

The 1979 General Election in the UK is often seen as a watershed in the modern history of housing policy in Britain (Balchin, Isaac and Rhoden, 1998; Jones and Murie, 2006, Mullins and Murie, 2006). The newly elected Conservative Government's strong market-orientated ideology, its focus on expanding home ownership at the expense of social housing and the resulting radical changes in tenure structure heralded a new era in which planning and housing policy became more responsive to market processes (Hincks *et al*., 2013). This re-orientation of policy provided the context for a somewhat limited body of academic literature that aimed to provide planners (mainly in the UK) with a better understanding of the structure and operation of local housing markets and thus help them 'accommodate the market'. The logical starting point for a systematic analysis of the structure and dynamics of local housing markets was seen as the definition of a local housing market area (HMA), the boundaries of which should be delineated on the basis of "the most appropriate functional area rather than the administrative boundaries of a local authority" (Jones and Watkins, 1999: 99).

Jones (2002) develops this argument in more detail in what with hindsight must be considered a seminal contribution to the evolution of modern housing market analysis. Noting that previous economics-based analyses of housing markets had been at a regional or city level, Jones (2002) highlights the lack of systematic research into defining HMAs and the fact that empirical analysis has "suffered from the use of administratively convenient boundaries that... may not have any functional meaning within the housing system" (Jones, 2002:549). Indeed, it is generally recognised that mis-specified boundaries may result in invalid analytical conclusions and sub-optimal planning outcomes (Goodman, 1998).

Initially, Jones (2002) critically examines the use of travel-to-work areas (TTWAs) as a means of defining spatial labour markets. Acknowledging the logic of this approach, grounded in the access-space model that emphasises the journey to work in a central urban location as a key determinant of residential location, Jones notes, however, that the assumptions underpinning this model, and, in particular, the assumption that employment is concentrated in city centres (see section 2.1.1 above), limit its usefulness in explaining housing market dynamics.

Jones (2002) is also critical of the spatial market search analysis advocated by Maclennan (1992), who argues that search patterns provide insights into the "perceived structure of the housing market and the local nature of demand", highlighting 'market pressure-points' and the nature of latent demand in terms of location or dwelling type. For Jones, however, Maclennan's use of administrative boundaries as the geographical unit of analysis significantly undermines the validity of his conclusions. In addition, Jones (2002) argues that practical data requirements of defining an HMA on the basis of search data is effectively prohibitive – something that is no longer such an issue due to the vast majority of initial housing searches being carried out online (Rae, 2015). Most importantly, however, housing search represents only the first stage in the migration process and is therefore not a transaction in its own right. It therefore fails to meet what Jones (2002) argues is the fundamental criterion for a HMA defined on the basis of economic principles – spatial arbitrage.

In developing his approach, Jones (2002) focuses on three key economic concepts: the *market*, *spatial arbitrage* and *substitutability*. Citing Stigler and Sherwin (1985), he defines a market as "the area within which the price of a good tends to uniformity, allowance being made for transportation costs" (Jones, 2002:552). For this to apply in the context of housing markets means that homebuyers consider transactions at any point throughout the market to be an appropriate substitute and as a consequence spatial arbitrage[5] takes place, namely "the process through which households trade constant-quality housing services between submarkets in order to gain from the price differentials" (Jones *et al*., 2005:220).

The underlying principle for defining an HMA, therefore, is that it is an area in which spatial arbitrage applies, which in turn "implies the need to use migration data to define contained areas within which house prices are determined" (Jones, 2002:552). Indeed, for Jones (2002) migration patterns are the essence of defining HMAs – in contrast to household search patterns – because they measure only *effective* demand and provide the key indicators of HMA boundaries by taking account of the basic economic principle of spatial arbitrage. However, this position assumes that the primary purpose of housing market analysis is to understand the dynamics of the market in an analytically pure way. It could be argued that if its primary purpose is to inform the evidence base for estimating future housing requirements then boundaries reflecting search patterns based on data that included unfulfilled demand are more meaningful (Brown and Hincks, 2008).

The use of migration patterns to delineate HMAs brings with it the need to determine the level of self-containment, something that Jones (2002) notes can only be done empirically, while acknowledging that both the access-space model and TTWAs can provide some initial guidance. The uni-nodal city presumes spatial arbitrage exists within a totally self-contained HMA, the boundaries of which correspond to the TTWA. In a multi-nodal city there is still likely to be a close relationship between the

[5] The exploitation of differences between the prices of commodities within or between markets by buying where prices are lower and selling where they are higher (Bannock *et al.*, 2003)

two with most households moving within their TTWA and only changing TTWA following a change of job that necessitates a move to a more distant location.

A HMA defined on economic principles and using migration flows as the basis for delineation, therefore is

> "a contiguous area comprising a settlement or group of settlements with a high degree of market self-containment, and where in-migration from outside the HMA is only of minor insignificance" (Jones, 2002:557).

Using this definition as the guideline, Jones (2002) then sets out in some detail a much more detailed methodology, illustrated by its application to an empirical study in the western Scotland.

The principle of self-containment is addressed first, and as there can be no question of total self-containment, additional criteria with regard to the appropriate level of self-containment are required. Noting that there is no strict theoretical foundation that can act as a guide, and that unlike the journey to work that occurs on a daily basis, household migration is a much rarer occurrence – Jones (2002) recommends that the level of self-containment for migration analysis should be lower than the 70 per cent typical for TTWAs. A criterion of 50 per cent of moves starting and ending within an area's boundaries as a proportion of the total moves into the area under consideration is considered appropriate.

In order to examine and illustrate his conceptual framework and practical proposals, Jones (2002) examined household migration patterns in the former Strathclyde region of Scotland (west central Scotland), which included the Clydeside conurbation and a large number of towns and villages, but excluded the remoter rural areas of Argyll and the islands. Information on household migration patterns was drawn from a unique dataset held by the Land Value Information Unit (LVIU) at the University of Paisley and is based on the Register of Sasines. It records not only the location and

characteristics of properties being bought, but also the date of the transaction and, most importantly, the origin of the buyer. The ensuing analysis was based on approximately 325,000 open market sales over a ten-year period (1984-93).

Instead of using Council administrative boundaries that are considered too large and in economic terms have no functional significance, Jones (2002) uses individual settlements as the basic building block for his analysis. Settlements are then grouped into HMAs using an 'iterative algorithm' that reflects the two basic components of the definition of a HMA: a high level of self-containment and very low levels of in-migration.

The first stage of the algorithm is straightforward. If at least 50 per cent of purchasers originate from within a particular settlement area, it is considered an HMA in its own right. If it is less than 50 per cent then an iterative process is undertaken that involves pairing the settlement area under consideration with the contiguous settlement with which it has the closest migration interlinkages. Initially all adjacent settlements that account for the origin of a minimum of five per cent of purchasers are examined. If there is only one that meets this criterion, then the two settlements are paired. If there is more than one, then the settlement under consideration is merged with the settlement with which it has the highest level of total migration flows (in and out). In both cases, if the settlement with which the original settlement under consideration is paired is a HMA in its own right, then the HMA is extended to include the original settlement. If not the process is repeated for the combined ('paired') settlements in relation to a new set of adjacent settlement areas. "In this way, 'open' settlements are married to 'closed settlements which already meet the containment criterion" (Jones, 2002:558).

Applying this iterative process to the data for west central Scotland Jones (2002) identified 22 HMAs, ranging from Glasgow (by far the biggest with almost 155, 000 transactions over the 10-year period) to much smaller ones such as Girvan (with around 1,000 transactions). The second key HMA criterion of 'lack of interconnection' is applied. The self-containment criterion of 50 per cent internal migration is extended to include the criterion of in-migration from an adjacent HMA accounting for less than five per cent of the overall number of house purchasers.

Jones (2002) notes in passing that if only the first (self-containment) criterion is applied, there are still significant flows between the 22 HMAs identified – particularly out-migration from Glasgow to certain settlements in adjacent HMAs and significant pair-wise movement between other adjacent HMAs outside Glasgow resulting in the second criterion (less than five per cent of in-migration from an adjacent HMA) not being met and being inconsistent with the lack of spatial arbitrage.

However, applying both criteria (50 per cent + self-containment and < 5 per cent in-migration) simultaneously reveals that a significant number of the HMAs defined using only the self-containment criterion do not meet the combined criteria. The new constellation envisages only 12 HMAs, with the Glasgow HMA having expanded to include a number of surrounding areas that had been initially identified as HMAs as well the merger of some other smaller ones with significant pair-wise interflows.

This new set of 12 HMAs also highlights the significant overlap between functionally defined HMAs and TTWAs, although there are a number of differences at the edges of the dominant Glasgow HMA, thereby in a sense providing further empirical evidence of the validity of the access-space model. Finally, Jones (2002) returns briefly to the somewhat arbitrary nature of the 50 per cent self-containment guideline and note that if this had been set at 60 per cent then the analysis would have result in only 6 HMAs. If it had been set at 40 per cent it would have led to 41 HMAs. Overall the 50 per cent rule “best achieves our original theoretically driven criteria, while at the same time best meeting our third test: a close embedded relationship with TTWAs” (p.559). Overall, the study indicates a sub-regional HMA structure that is dominated by the Greater Glasgow conurbation. Household migration patterns indicate an ongoing process of spatial arbitration that takes place over substantial geographical areas. However, there are also a number of small towns (e.g. Girvan), and some remoter rural areas which operate as fairly closed HMAs.

The empirical work undertaken by Jones (2002) in west central Scotland shows that the 11 functionally defined HMAs identified by no means conform to geographical areas defined on the basis of administrative boundaries (or indeed TTWAs). Furthermore, it provides substantive evidence that housing market analysis based on

local authority boundaries could lead to misleading results, including the mis-specification of submarkets or housing demand. It also, for the first time, highlighted the potential for developing a consistent national framework for housing market analysis that could be used as the basis for local housing needs assessment and the associated land use requirements for development planning purposes.

This thesis has examined the ground-breaking contribution of Jones (2002) in some detail for a number of reasons. Firstly, it provided an analytical framework for housing market analysis that was grounded in economic theory; secondly, it provided some sound evidence to show that the use of administrative boundaries for housing need/demand assessment was sub-optimal; and, thirdly, it highlighted a practical methodology using available data to enable the development of a consistent national framework for housing market analysis. It can be no accident that although a number of subsequent academic papers have applied, and in some cases, and for good reason, modified, the methodological approach set out by Jones (2002), there is no indication of substantive criticism. Indeed, as will become apparent in Chapter 3, this broad approach became the accepted Government recommended methodology underpinning the delineation of HMAs in England and Scotland, and more recently in Northern Ireland.

Brown and Hincks (2008) set out a basically similar approach, but use a more flexible interpretation of the concept of spatial arbitrage adopted by Jones (2002) to simply mean “the process of buying and selling a good at a uniform price… in a housing market [where] buyers consider transactions at any point in a geographical area to be an appropriate substitute” (p.2228). They also modify their methodology to take into account differences in data availability in its application to North West England. Like Jones (2002), they note the well-established local authority role in planning for housing, including the assessment of the amount of land required to meet future housing requirements, and the inadequacy of the consequent use of council administrative boundaries as substitutes for housing market boundaries defined in terms of economics and how housing markets actually operate.

Brown and Hincks (2008) note that the evolution of housing market analysis also reflects a move away from a more traditional approach to urban economics that

focused on individual urban housing markets at the regional scale and argue that housing markets are best analysed at the sub-regional scale. They also highlight the importance of setting out a number of principles that need to be accommodated as far as possible in any methodological specification for delineating housing market boundaries.

Drawing on the Government's Housing Market Assessment Manual (DTZ Pieda, 2004), Brown and Hincks (2008) highlight the geographies of commuting and migration and housing search patterns as issues to be considered, but like Jones (2002) argues that "migration is the defining feature of HMA delineation" (Brown and Hincks, 2008:2228). However, Brown and Hincks (2008) argue that housing search patterns should be accommodated within the methodology too, but noting that to do this successfully would require the collection of huge quantities of qualitative data, they recommend using a consultation process with local estate agents as a more practical substitute.

Brown and Hincks (2008), like Jones (2002), also focus on the migration-related concept of spatial arbitrage. However, while not disagreeing with the principle, they note that, unlike in Scotland, in England there is no equivalent to the Sasines database. Land Registry data, the nearest equivalent, does not record origin and destination data for individual transactions, and therefore cannot explicitly reflect spatial arbitrage. However, Brown and Hincks (2008) suggest an alternative approach using migration flow data from Census of Population records, arguing that it is "subtly different from the spatial arbitrage principle in reflecting supply and demand rather than an active transaction" (p.2229). It reflects the fact that actual migration flows are the outcome of the interaction of supply and demand in the context of a broadly defined housing market area, reaffirming the principle that it is consumer behaviour rather than administrative boundaries that defines the geography of a housing market area (Meen and Meen, 2003). In contrast to Jones (2002) who sees actual migration as epitomising market realities, Brown and Hincks (2008) view the fact that migration flows by definition ignore excess demand as a disadvantage in terms of best understanding the market.

Having established that aggregate migration flows are a suitable data source for calculating the principle of self-containment, Brown and Hincks favour a threshold of 70 per cent (instead of 50 per cent), reflecting the data limitations of using the Census migration data[6] and the consistency with the threshold used for TTWA definition in England (Coombes and ONS, 1998). However, Brown and Hincks (2008) acknowledge that there is no consensus on how these issues should best be addressed in the detailed methodology. Instead of the iterative process used by Jones (2002) that relies on the strength of migration flows between settlements and the progressive merging of paired settlements, Brown and Hincks (2008) use a modified version of the 'Intramax Procedure' developed by Masser and Brown (1975) to analyse flows in interaction matrices through hierarchical aggregation based on the relative strength of interactions. Its application in the context of housing markets obviously requires the application of "a contiguity constraint to identify areas that share a common boundary" (Brown and Hincks, 2008:2232). The Intramax Procedure gives no guidance on determining an appropriate number of housing market areas. Brown and Hincks (2008) welcome this flexibility and recommend using qualitative information from estate agents to help decide what should be considered as HMA 'cores' and taking into account the geography and number of TTWAs.

In determining the HMAs for North West England, Brown and Hincks (2008) apply what appears to be a more complex iterative procedure than the one applied by Jones (2002) in Scotland. Initially 43 groups of wards were identified, but by applying the 70 per cent self-containment rule and examining in more detail flow patterns and self-containment issues this number was reduced down to 25 HMAs. Each of these satisfied the agreed self-containment criteria and were in accordance with information gathered from estate agents. However, the resulting HMA geography was significantly different from one based on local authority boundaries. There was considerably more overlap with TTWA boundaries, particularly in densely populated urban areas such as Manchester and West Lancashire, but much less so in the more

[6] The Census (Special Migration Statistics) records the origin and destination of migrating households over the twelve month period prior to the Census.

rural areas of Cumbria and raises the issue of whether a consistent application of self-containment thresholds is applicable throughout the North West region.

Much of the rest of the somewhat limited academic literature tends to focus on reviewing and evaluating the practical application of these two methods to different parts of the UK. However, Royuela and Vargas (2008) have applied the methodology set out by Jones (2002) to define HMAs (a methodology that used an iterative algorithm that focused on migration self-containment, see above) to both commuting data and household migration data for Catalonia (Spain). They argue that HMAs defined on the basis of commuting patterns are more homogenous in terms of dwelling prices than those defined using migration pattern. This finding is explained by reference to the availability of migration data over a period of 13 years (1991-2003) compared to the use of 2001 Census data for Catalonia, and by the difficulty in differentiating a HMA from a housing submarket using migration self-containment as the criteria, a point which is addressed in more recent UK-based academic articles (see below).

In a significant and more recent contribution to the academic literature Jones *et al*. (2012) develop a "tiered geography of local housing market areas" that aims to set out a "practical and consistent national geography of HMAs for England… in the face of both theoretical and practical challenges" (p.2635). The study is contextualised by noting the rapid growth in the application of HMAs as frameworks for planning for housing in England in the 2000s. This rapid growth had been driven by Government guidance (DCLG, 2007a and 2007b) that in turn had been inspired by the academic literature. However, the inherent flexibility and pragmatism that characterised Government guidance had resulted in the identification of sub-regional amalgamations of HMAs that were defined on the basis of different criteria and lacked consistency and comparability. Jones *et al*. (2012) also emphasise the fact that the outcomes of spatial analyses partly depend on their underlying geographical delineation and, echoing an important consideration emerging from the housing market geography of North West England (Brown and Hincks, 2008) – question whether the same criteria are applicable to all economic and geographical contexts.

The consistent tiered-geography of HMAs proposed by Jones *et al*. (2012) is grounded, once again, in economic theory (and in particular on the access-space model), but the study focuses on the theoretical and empirical relationships between two functional economic geographies: HMAs and labour market areas. Jones *et al*. (2012) note that labour market areas are normally defined on the basis of commuting patterns that identify areas with relatively self-contained clusters of journeys to work, but that the academic literature on the relationship between HMAs and labour market areas is very limited. Citing Coombs (2009), who used census data to test this relationship, Jones *et al*. (2012) note that the results varied markedly even after using different levels of self-containment criteria and conclude that this empirical evidence contradicts Government advice (DCLG, 2007a) that labour market areas can be considered 'close surrogates' for HMAs.

Despite this Jones *et al*. (2012) return to the fundamental starting point – the distance decay function from the city centre. They see the journey to work as a key factor in shaping the geography of housing markets and argue that the outer boundaries of HMAs are defined by the journeys of long-distance commuters from a 'dominant accessibility point', with 'spatial house price arbitrage' taking place within this wider labour market area – and introduce the concept of a '*framework* HMA'. However, Jones *et al*. (2012) acknowledge the weaknesses of this generalisation, including the fact that the underlying access-space model represents a long-term equilibrium view and ignores the short-term dynamics of local housing markets and their segmentation. This implies that the extent of spatial arbitrage in the broader 'framework HMAs' is fragmented and that it can effectively be subdivided into a number of component HMAs. Jones *et al*. (2012) conclude that the "heterogeneity of housing, the diversity of neighbourhoods and locations within a sub-region and the short distances often moved by households can thus produce sub-systems and tiers within a 'framework HMA' due to the differences not being arbitraged away" (p.2639). This statement highlights what could be considered the most significant contribution of this study: that there is evidence of an intermediate geography of '*local* HMAs' that lie between the broader Framework HMAs and the submarkets, traditionally defined using hedonic analysis. Jones *et al*. (2012) illustrate this point by

reference to stages in family life cycles, with changing household composition necessitating movement across submarkets defined in terms of housing stock and household composition but within the same 'local HMA'. Spatial arbitrage between 'local HMAs' (and within these between any submarkets that exist) is constrained so that different component parts of the same 'framework HMA' can be significantly different. "Spatial arbitrage occurs, but indirectly and with a time lag" (p.2639).

The actual empirical research undertaken by Jones *et al*. (2012) uses a staged approach to develop a tiered HMA geography by applying a grouping algorithm to commuting and migration data, whereby the boundaries of 'local HMAs' are embedded within the wider Framework HMAs. The analysis examined different levels of closure for both commuting and migration data. A 75 per cent self-containment level was chosen to define commuting patterns used to define 'framework HMAs' – a level higher than for TTWAs because it includes longer-distance commuters. The chosen level of migration closure used to define a 'local HMA' was 50 per cent because this, unlike other cut-off points, produce broadly contiguous areas. The final stage of the process is guided by analysing house prices using hedonic regressions and a Chow test to see if statistically significant differences in standardised house prices emerge between HMAs identified on the basis of migration analysis – an approach traditionally in identifying housing submarkets.

The resulting housing geography, therefore, envisages two tiers: (1) 'framework HMAs' reflecting long-distance commuting flows and a long-term spatial framework, and (2) 'local HMAs' defined by migration patterns that in turn reflect short-term spatial arbitrage. A third tier (outside the scope of the study undertaken by Jones *et al*. (2008) is acknowledged: housing submarkets defined in neighbourhood terms or house type and related price differentials.

The study by Jones *et al*. (2012) must be recognised as providing useful additional insights into the relationship between the geographies of labour markets and housing markets and for having achieved its objective of providing a consistent geography for the analysis of future housing requirements. However, the authors accept that this theoretical hierarchy works better for areas dominated by a large urban employment centre and less so in areas with a number of similar sized towns

or indeed in more rural areas where migration flows tend to be of a much longer distance. It also, however, adds another tier of complexity to the already complex process of identifying HMAs and submarkets, and blurs the conceptual differences underpinning the definition of 'local HMAs' and housing submarkets, a point examined more fully in the next section (2.4.3).

In another more recent contribution to the academic literature, Hincks and Baker (2012) critically examine the application of the theory of functionally defined HMAs in the real world. As with the other main contributions, they re-iterate the importance of recognising that the use of administrative boundaries in delineating HMAs restricts the usefulness of any consequent analysis. Having outlined the policy framework in England and Scotland (which is examined in Chapter 3 of this thesis), Hincks and Baker (2012) emphasise the importance of the access-space model – the trade-off between dwelling price and residential location (the distance decay curve) that lies at the heart of the economic theory underpinning the definition of HMAs.

Hincks and Baker (2012) also evaluate a number of conceptual frameworks that have influenced the theory and practice of HMA definition. Echoing Jones (2002), they see housing market search as the first step in the process of household migration, the geographical pattern of which is influenced by a combination of household choice, constraints and opportunities (supply) – all, in turn, influenced by the life-cycle stage of the individual households (de Groot *et al*., 2011). In line with an earlier paper (Brown and Hincks, 2008) they emphasise the impracticality of gathering the qualitative data required to operationalise this approach and note that it does not reflect the principle of spatial arbitrage. However, they do agree with Maclennan (1982) that it can act as a useful guideline for an initial view of the 'nodes' that provide the focus for defining HMAS.

For Hincks and Baker (2012) spatial arbitrage remains the most important defining characteristic of HMAs, namely that "buyers consider transactions at any point in a given geographical area to be an appropriate substitute" (p. 875). Because in a housing market, the product being bought/sold is fixed, the purchaser has to move to occupy the home purchased. The result is migration flows that encapsulate the interaction of housing supply and (effective) demand. Hincks and Baker (2012),

however, recognise that there are problems applying this principle of spatial arbitrage in practice and, in particular, where households leave the owner-occupied sector to enter the rental sector, in which case the arbitrage takes place between two separate but interacting markets. However, while this reflects the views of Ferrari (2011) by giving greater weight to analysing the housing system as a whole, it offers no insight into the extent to which spatial arbitrage might operate differently in the private rental market.

Hincks and Baker (2012) also throw new light on the validity of the trade-off between residential location and the length of the journey-to-work. Evidence from more recent research indicates that the nature of the trade-off has been altered by a combination of changing attitudes to work-life balance and advances in technology (including transport). This has resulted in trade-offs that are now more likely to reflect career progression and a desire for a greater balance between access and quality of life, rather than being reflected in a residential location that merely provides an optimum journey to work (Ommeren *et al*., 1997; Rouwendal, 2004; Hincks and Wong, 2010). However, this does not negate the underlying importance of the journey to work, and, echoing Jones *et al*. (2010), indicates the desirability of defining HMA boundaries on the basis of commuting patterns of households with the longest journeys-to-work, which then provide a broader "framework within which spatial housing market processes work" (Jones *et al*., 2010:8). This in turn leads Hincks and Baker (2012) to a somewhat similar conclusion as Jones *et al*. (2010) that an upper-tier of HMAs should be defined on the basis of long-distance commuting patterns and a lower-tier comprising more local HMAs characterised by "high intra-HMA arbitrage and low inter-HMA arbitrage" (p.877). The upper tier HMAs would form 'strategic' policy areas while the lower-tier would reflect the heterogeneity of housing and constraints placed on the process of spatial arbitrage by localised patterns of migration. Hincks and Baker (2012) argue that it is "this constraint on spatial arbitrage – reflected through the localisation of migration – that drives the definition of sub-tier HMAs" and is validated by house price analysis that indicates a statistically different standardised house price and reflects the principle that dwelling prices within a HMA should tend towards uniformity.

However, this appears to blur the relationship between HMAs and housing submarkets and is explained – though only to a certain extent – by viewing the sub-tier HMAs as quasi-independent components of the upper-tier, where spatial arbitrage occurs, but with a time lag extending over a lengthier period. Indeed, the distinction between HMAs and submarkets can be difficult to discern in practice because submarkets, too, have been found to have high degrees of migration self-containment (Jones *et al*. 2004, 2005), an issue that is examined further in section 2.4.3 below. Processes within the upper-tier HMA have differential impacts on the lower-tier HMAs (defined by constraints on the process of spatial arbitrage) due to the operation of significantly different localised supply and demand regimes, that in turn reflect the functionality of distinctive neighbourhoods or their structural characteristics in terms of dwelling type and quality. What emerges from this conceptual analysis is that functional housing markets are 'variegated' and differences in "inputs and processes underpinning housing markets provides a local articulation of outcomes that affect the form, function and structure of housing markets in space and through time" (Hincks and Baker, 2012:893).

This methodological complexity and definitional inconsistency is reflected in England in the competing approaches that emerged in the 2000s in response to the Government's guidelines on Strategic Housing Market Assessments (DCLG, 2006, 2007a, 2007b; Coombes, 2009). Ferrari *et al*. (2011) highlight the North West of England, in particular, where analyses based on competing conceptual and methodological approaches and resulting in significantly different HMA geographies for the same region – were produced by a range of academics and consultants (ECOTEC, 2006; Brown and Hincks, 2008; Nevin Leather Associates *et al*., 2008). The HMA boundaries adopted in all these three cases differed significantly from the geography of local administrative boundaries and there was a broad similarity in HMA boundaries in certain areas, such as Cumbria. However, Hincks and Baker (2012) conclude that because all three included an 'interpretive element' that resulted in varying degrees of disconnect between the underlying theoretical concepts and the technical components of the approaches they were open to criticism in terms of replicability and transparency. It is this difficulty of how to

balance technical with interpretive that in turn has led to ongoing uncertainty in the HMA definition process.

Hincks and Baker (2012) re-affirm the importance of defining HMAs on the basis of a conceptual framework that includes the principle of spatial arbitrage, housing market search and the journey-to-work and recognises that housing market processes operate at different geographical scales. Ideally market search patterns would identify the 'nodes' at the centre of HMAs and the access-space model would be reflected in the use of long distance commuting patterns to define upper-tier HMAs. Their component sub-tiers could be delineated on the basis of spatial arbitrage: a high degree of intra-HMA arbitrage and a corresponding low degree of inter-urban arbitrage that, in the last analysis, recognises the 'variegated' functionality of housing markets. Recognising this complexity and the limitations set by data availability and quality, and drawing on the evidence from North West England, it appears that in practice a sub-optimal 'constrained' approach is required, an approach characterised by "conceptual uncertainty and methodological and technical limitations" (Hincks and Baker, 2012:895).

Given this complexity, it is therefore not surprising that academics were reluctant to add a further layer by examining tenure-related differences. However, while a number of journal articles highlight awareness of the issue, only one has actually addressed it in more detail: the study undertaken in North West England by Jones and Coombes (2013). The aim of this study was to evaluate tenure-specific HMA boundaries as the spatial framework for planning for housing. It acknowledges the attempts made by central and local Government since the beginning of the 2000s to develop planning policies that are more responsive to the market, but sees the apparent inability of planning authorities in England to develop consistent HMA boundaries, delineated with a minimum of arbitrariness as a significant hurdle to the practical application of housing market analysis. It also acknowledges the work undertaken by Jones *et al*., 2010) in terms of addressing the issue of consistency by providing a comprehensive three-tiered hierarchical approach based on clearly defined theoretical concepts. However, given that tenure is a very significant dimension of the housing market, Jones and Coombes (2013) correctly point out that

deeper insights into the dynamics of housing markets must "take account of the tenure structures that create cleavages in the housing system" (p.994). In particular, despite the fact that the provision of affordable housing through planning agreements is a central plank of housing policy in GB, planning forecasts do not take the issue of tenure into account and "are broadly tenure-neutral in terms of land supply goals" (p.994). Indeed, as Jones (2011) points out the analysis underpinning estimates of housing requirements often do not only not take the effects of tenure structure into account but also only measure affordability in terms of access to the owner-occupied sector.

Jones and Coombes (2013) highlight significant differences in the socio-economic and demographic profile between households in the owner-occupied, private rented and social sectors. They consider that these differences in household composition, provide the rationale for assessing future housing requirements within a tenure-specific framework – an argument that is reinforced by the overwhelming dominance of owner occupation in suburban and rural areas compared to the cities and university towns where the private rented and social sectors play a much more important role.

Jones and Coombes (2013) reinforce the importance of consistent theoretically sound boundaries for housing market analysis with specific reference to the private rented sector. Citing research undertaken by Shelter (2009), Jones and Coombes (2013) highlight that boundaries are of critical importance in terms of local reference rents that determine the amount of Housing Benefit to private tenants. In Cambridge, for example, the Broad Rental Market Area includes the city itself (a flourishing academic centre with relatively high rents) and some adjacent rural areas where rents are typically much lower. This has resulted in households on lower incomes, which are dependent on Housing Benefit (local housing allowance) being unable to live in the city where many of the employment opportunities are located, something that in turn distorts attempts to plan for and provide sufficient affordable accommodation.

Jones and Coombes (2013) briefly summarise the key academic studies undertaken in GB (Jones, 2002; Brown and Hincks, 2008; Coombes, 2009) that either focussed

exclusively on the owner occupied sector or, by examining overall household migration patterns, were in effect tenure neutral. Each of these studies was based on HMAs that were defined using the concept of spatial arbitrage, with the market price/rent of a standard house being approximately the same across the entire HMA and that the actual boundaries of the HMA are determined by high levels of 'closure' (i.e. self-containment) in terms of household migration.

Jones and Coombes (2013) also highlight a number of issues which complicate the application of the concept of spatial arbitrage, notably the issue of inter-tenure moves, the fact that a dwelling itself can change tenure and that the relative price between tenures can change. However, "given the complexities of these inter-tenure shifts and the information constraints in the housing market" these processes are "arguably of minimal significance in practice" (p.1001). They therefore view spatial arbitrage as a process that takes place internally within each tenure. There is, however, another problem: the authors correctly recognise that the spatial arbitrage process cannot be seen to work in social housing because household migration does not alter the level of rents. However, they do not consider the very significant role that Housing Benefit plays in supporting tenants in the private sector, and the impact this has on the process of spatial arbitrage. In Northern Ireland, in 2012 for example, approximately 50 per cent of private tenants were in receipt of Housing Benefit (NIHE, 2012), enabling them to live in dwellings at a rent that they otherwise in most cases could not afford. Thus, Housing Benefit modifies the process of spatial arbitrage and therefore cannot result in HMAs that are delineated on the same basis as those for the owner-occupied sector. Jones and Coombes (2013) conclude that aggregate household migration patterns that are not tenure-specific can at best provide an approximation of spatial arbitrage and given that the socio-economic and demographic profiles of owner occupiers and private renters differs significantly, the migratory patterns, levels of migratory self-containment and therefore their respective HMA boundaries are likely to be significantly different.

The tiered geography of HMAs for England (Jones *et al*., 2010) provided the basis for the empirical analysis of the tenure specific HMAs. The *Framework* HMAs based on 77.5 per cent commuting closure were subdivided into *Local* HMAs (based on 50 per

cent migration self-containment) and it was these that Jones and Coombes postulated could be replaced by three sets of tenure-specific HMAs: one for each of the three main tenures, each delineated independently within the *Framework* HMAs. Using the 50 per cent self-containment level as a benchmark the study found that for England as a whole migration self-containment levels for social housing were consistently above 65 per cent (although boundaries were somewhat fragmented due to the absence of social housing in many areas of the country). In the case of the owner-occupied sector, the vast majority of *Local* HMAs have self-containment levels of less than 65 per cent. In the case of the private rented sector they are typically less than 55 per cent – a phenomenon that Jones and Coombes (2013) put down to many migrants changing jobs and therefore liable to move further afield, but something that could be of significance, particularly in large urban areas where there are high concentrations of privately rented dwellings.

In the next stage of the research Jones and Coombes (2013) use a somewhat different grouping algorithm (Coombes, 2009) that identifies clusters of flows of any form to identify areas where the proportion of flows start and end in the same area and meet the set level of closure (50%). In order to minimise the effect of student migration the researchers used a specially commissioned ONS dataset that excludes all migrants under the age of 25 (the authors acknowledge the crudeness of this demarcation). The resulting analysis identified 318 owner-occupied HMAs (OOHMAS), 238 PRSHMAs and 777 social sector HMAs (SOCHMAS) within a common set of Framework HMAs, indicating significant differences in the average size of tenure-specific HMAs – particularly in relation to social housing. The corollary of this is that in areas with a high proportion of social housing, aggregate *Local* HMAs will tend to be smaller than appropriate for analysis of the two private sectors (owner-occupied and privately rented).

In the final stage of the analysis, Jones and Coombes (2013) focus on North West England, a region that provides a wide range of urban and rural settlements. The analysis highlights that in more rural areas there is a considerable degree of overlap between aggregate Local HMAs and tenure specific ones for the owner occupied and

private rented sectors. However, in the larger urban areas there are fewer OOHMAs and PRSHMAs, indicating tenure-specific housing market dynamics at work.

Jones and Coombes (2013) conclude that differences in the socio-economic and demographic profiles of households in each of the three main tenures lead to housing market processes and migration patterns that are tenure-specific. Hence there is a strong case for housing market analysis, and more specifically the spatial framework for the assessment of future housing requirements, to have a stronger tenure focus. The case study of North West England indicates that SOCHMAs tend to be smaller and more fragmented than aggregate *Local* HMAs (and are not influenced to any significant degree by the process of spatial arbitrage). In the more rural areas, there is a significant overlap between OOHMAs, PRSHMAs and the aggregate *Local* HMAs. In larger urban areas such as Greater Manchester, where there are high concentrations of the private rented sector the situation is different. The study highlighted some subtle differences between OOHMAS and the *Local* HMAs. However, the geography of the PRSHMAs is significantly different from that of the aggregate *Local* HMAs, indicating the need to incorporate more tenure specific analysis into a planning system that is attempting to respond in a more meaningful way to market signals, including, in particular, provide better local measures of affordability broken down by tenure and dwelling type.

2.3.3 Submarkets – their definition and relationship to HMAs

The penultimate section of this chapter focusses on the definition and delineation of housing submarkets in the context of planning for housing. It draws on a number of previous sections, including, in particular, section 2.3.1, which examined the econometric concepts underpinning hedonic modelling. It also highlights the connection between the analysis of housing submarkets and 'filtering' (section 2.2.2) and addresses more specifically the issue of the relationship between submarkets and the wider concept of a HMA raised in the previous section.

Jones (2002) not only provided the seminal work with regard to the operationalisation of the theoretical concepts underpinning the definition and delineation of HMAs, but also some useful insights into the theoretical basis for, and

dynamics of, housing submarkets. Noting the substantial empirical literature supporting the existence of submarkets (Watkins, 1998), Jones (2002) argues that the theoretical basis for submarkets has a similar point of departure to that for HMAs, but by definition must be recognised as forming constituent parts of HMAs. Submarkets arise because the process of spatial arbitrage that lies at the heart of a functionally defined HMA may be constrained by a variety of factors, including transaction costs, suboptimal housing market information and inelastic supply (due, for example, to planning constraints). This results in the price of a standardised dwelling being significantly different in each submarket. Furthermore, because the concept of a submarket is closely linked to the process of spatial arbitrage (underpinned by the concept of substitutability), submarkets are liable to change over time, for example, by means of the construction of new dwellings or a significant change in tenure structure.

Jones (2002) concludes by emphasising that the distinction between a HMA and a housing submarket is not merely one of semantics. "Both have their origin in the spatial arbitrage process, but, while submarkets occur because of constraints on the arbitrage process within a local market, HMAs are defined by the existence of *internal* spatial arbitrage and the long-term absence of spatial arbitrage/substitutability *between* each other" (Jones, 2002:554; emphasis added). This implies that HMAs are a much more stable housing market phenomenon than submarkets, which – depending on the specific causes of their origin – are much more likely to change over time.

Jones *et al*. (2004) argue that although the potential for housing submarkets to provide a useful basis for analysing the impact of policy changes on local housing markets had been recognised for some time (Maclennan and Tu, 1996), the absence of agreement on their definition and delineation meant they had not been adopted more widely as a spatial framework for analysis. Jones *et al*. (2004), therefore, argue there is a need to re-examine the concept and the tests applied to identify them and see intra-urban migration as playing a key role in the dynamics of submarkets. Their paper sets out to show that "current established statistical techniques are not

sufficient (even if the theoretical limitations are accepted) and need to be augmented by reference to intra-urban mobility" (Jones *et al*., 2004:270).

Jones *et al*. (2004) contrast this approach, which emphasises the dynamic processes underlying the spatial structure of urban housing markets, with hedonic modelling that, at least implicitly, presumes that submarkets are in equilibrium and focuses on outcomes rather than the processes leading to the price differentials. This combination of assumed equilibrium and absence of verification through an examination of the underlying processes limits the conclusions that can be drawn from submarket analysis based on hedonic techniques and on this basis they conclude that "standard submarket tests are incomplete and need to be extended" (p.273).

This conclusion is further justified by stating that in order to identify submarkets it is not enough for cross-sectional hedonic studies of segmentation in urban housing markets to show that there are significant differences in the price of a standardised dwelling, they must also explore the role of 'demander sub-groups'. Differences in the price of a standardised dwelling between submarkets reflects the interaction of "segmented demand and heterogeneous supply" with "different types of buyers… drawn to different classes of property depending on their needs, preferences and resources" (p.273). For Jones *et al*. (2004), therefore, the linkages between the distinct classes of property on the supply side and the various groups of consumers on the demand side have to be differentiated and the way to do this – drawing on the work of Grigsby – is to focus on intra-urban mobility. Jones *et al*. (2004) conclude that submarkets identified using hedonic techniques such as the procedure developed by Schnare and Struyk (1976) and put into practice with a substantial degree of variation in terms of the adopted definition and interpretation of market areas (Adair *et al*., 1996), including in the context of the private rented sector (Des Rosiers and Thériault, 1995) should be augmented by analysis that indicates distinct migration patterns, and in particular high levels of self-containment.

In the empirical section of their academic paper, therefore, Jones *et al*. (2004) focus on analysing intra-urban migration patterns in Glasgow with a view to determining to what extent submarkets delineated using hedonic procedures are consistent with

household migration patterns. The study utilises the same University of Paisley LVIU data source as Jones (2002) (see section 2.5.2), for the period April 1991 to March 1992, because exceptionally for this period the data included the postcode as a means of uniquely identifying the origin and destination address of the purchasers. Approximately 16,000 open market private house sales were analysed. The study area comprised the Glasgow HMA identified by Jones (2002) and the starting point for the analysis was the set of six potential housing submarkets identified on an a priori basis by Watkins (2001) and comprising an amalgamation of contiguous postcode areas.

Watkins' (2001) regression modelling resulted in equations that accounted for more than 60 per cent of the submarket price variation, with the exception of the city centre where the small number of transactions may have played a role. Chow tests confirmed that submarkets existed, but while there were significant price differentials between some submarkets, this was not the case for all six. Indeed, Watkins (2001) concluded that on the basis of the Schnare and Struyk (1976) procedure (see Section 2.3.1), that the west and north-west segments and the south, south-west and city centre segments should be combined. Only the east segment remained on its own – giving a total of three submarkets for Glasgow city, instead of the six originally proposed.

Jones *et al*. (2004) then examine intra-urban migration patterns for both sets of submarkets (the original set of six and the set of three derived by applying the Schnare and Struyk procedure). Their analysis shows that in the case of the six submarket spatial structure more than 50 per cent of all homebuyers relocate within the same submarket in five out of six cases (ranging from 52% to 66%). The one exception is the city centre with only 32 per cent migration self-containment – much of the remaining in migration to this submarket is from Greater Glasgow or the wider Strathclyde region. In the case of the three-way segmentation there are also high levels of migration closure (ranging from 52% to 64%). Overall, therefore, the analysis indicates a close association between intra-urban migration patterns and the submarket structure delineated by both approaches, thereby reinforcing the case for the existence of submarkets. However, closer examination reveals a number of issues

that would suggest that the three-way subdivision derived using the hedonic approach is open to question. Firstly, the high level of migration closure for the six-fold subdivision itself and, secondly, the open submarket in the six-fold subdivision (city centre) has the closest migratory links with the western submarket rather than either the southern or south-western submarkets with which it is combined in the hedonic analysis.

Jones *et al*. (2004) also examine the case for submarkets based on house type that may be nested within the spatially defined submarkets. They explore the potential impact of three sub-divisions: houses and flats, new build and second-hand and Right to Buy (RTB) and non-RTB. The analysis of this more disaggregated pattern of migration clarifies three issues and confirms the following. Firstly, that there are also high levels of self-containment for these three types of transactions, with two exceptions: the city submarket and new build transactions; secondly, that household migration plays a key role in defining spatial submarkets; and, thirdly, that the three-way segmentation of the Glasgow HMA is more meaningful in functional terms. In addition, the analysis indicates the likelihood of nested submarkets based on house type within the overall submarket framework and that, in particular, there may well be wider submarket spatial structures that are not in accordance with the three-fold submarket segmentation.

It should be noted, however, that Maclennan and Tu (1996) are critical of analyses that class qualitatively different groups of dwellings as constituting submarkets and consider such the identified price differentiation as reflecting different combinations of dwelling characteristics, i.e. 'product groups'. Area based submarkets on the other hand recognise that "after standardising for the full range of factors (including property groups), significant price differences exist across areas" (p.394). Conversely, however, Maclennan and Tu (1996) are in agreement with Jones (2002) and Jones *et al*. (2003), that in essence submarkets develop because the process of spatial arbitrage within an HMA is constrained by market imperfections such as search costs, imperfect information and inelastic supply (due possibly to planning constraints or lags in construction) resulting in significant variations in the price of a standardised dwelling between submarkets.

Based on the findings of their empirical analysis of the Glasgow HMA, Jones *et al*. (2004) conclude that the standard hedonic approach to delineating housing submarkets is incomplete. Furthermore, they recommend a supplementary analysis of intra-urban household migration that both contributes to the rationale for the chosen spatial submarket structure of a specific HMA as well as contributing valuable insights into the dynamics of local housing systems.

Jones *et al*. (2005) extend the application of the concept of submarkets to help generate insights into the dynamics of local land and property markets with a specific focus on planning for housing, in particular establishing the medium-term land requirements for new housing developments. Noting the 'lack of economic content' underpinning the often sophisticated analyses undertaken by planners based on forecasts of household formation rates and tenure choice (O'Sullivan, 2003), Jones *et al*. (2005) set out to show how the economics-based concept of housing submarkets can provide a valuable framework for planning to meet the requirement for new housing. Citing Jones and Watkins (1999) and Maclennan (1992) they advocate combining the 'explicit examination' of the migratory flows that underpin the dynamics of local owner-occupied housing markets within a sub-regional framework of HMAs with an analysis of demographic trends and demand for other tenures. This would provide a logically transparent research process incorporating market information that would inform the allocation of land for housing in terms of both quantity and location.

Jones *et al*. (2005) echo the view that the resources required to carry out an effective hedonic modelling exercise to determine housing submarkets has militated against the practical application of a submarket framework for planning for housing. However, because the "existence of submarkets requires spatial interaction clusters between segmented demand and heterogeneous supply as reflected by migration within a local housing market" (p.220) the delineation of submarkets in the owner-occupied sector can be facilitated by applying clustered household migration analysis.

The empirical section of the paper by Jones *et al*. (2005) builds on the analysis undertaken in Glasgow by Jones *et al*. (2003; 2004) and focuses on the owner-

occupied sector of the market between 1983 and 1998. Decisions by planners with regard to the volume and location of land allocated for new housing developments was undertaken in a policy context characterised by piecemeal housing-led renewal projects and tenure transfers under RTB and focused on addressing issues in the social rented sector (Goodlad, 2001). Noting that the previous research on Glasgow's submarkets had demonstrated the connections between clusters of intra-urban migration patterns, Jones *et al*. (2005) examine the internal coherence of submarkets and how a submarket framework can be utilised as a framework for the analysis underpinning planning for housing.

The analysis by Jones *et al*. (2004) had examined the issue of submarkets based on house type nested within spatial submarkets, but had not explored the coherence of these markets based on migration interaction at different price ranges (based on council tax bandings A - H). The analysis revealed there was a high level of self-containment in Band A (the lowest price band) in all submarkets. In the West, Northwest and Southwest submarkets more than 80 per cent of moves originated within the same submarket with a tendency for the degree of self-containment to progressively reduce in line with increasing dwelling prices. Only the Central submarket remained consistently open (above tax band A) reflecting the high proportion of migrants who originate from outside the city. Drawing attention to the relatively low level of internal coherence in both the Central and Northwest submarkets Jones *et al*. (2004) suggest on the basis of the house price analysis that there may only be four submarkets in Glasgow.

The more significant element of the empirical analysis involved an examination of price trends in each submarket based on repeat sales 1985-97. This revealed significant differences in house price trends between the various submarkets. Jones *et al*. (2005) observe that short-term relatively modest changes in real house prices may be connected to demand/supply imbalances, but this is difficult to substantiate. However, over a longer period of time the submarket house price data shows a clear divergence in trends. The fastest rate of increase in house prices was recorded in the upmarket Western sector of Glasgow, followed by the Central submarket. Similar rates of increase were recorded in Northwest and East submarkets and indeed this,

together with other similarities in terms of the trends, led Jones *et al*. (2003) to argue that they could be considered a single submarket. Similarly, the data confirms the much closer migratory interaction between the Central and the West rather than any other submarket (see Jones *et al*., 2004), with their repeat-sales indices co-integrating over the longer term. These findings would tend to substantiate the more general house price analysis summarised in the previous paragraph that questioned the existence of the Central and Northwest submarkets. Furthermore, although the Jones *et al*. (2005) do not specifically mention it, this four-fold submarket classification based on a repeat sales analysis is not only different from both the three-fold hedonic classification, but also the four-fold classification set out in Jones *et al*. (2004).

Jones *et al*. (2005) also seek to delve deeper into the role of dwelling price and spatial arbitrage in the interaction between submarkets, by examining the housing choices made by individual households. Drawing on 'filtering' theory they argue that households wanting to trade up (or down), but who are unable to find a suitable dwelling within their current submarket are likely to be a major factor in the interaction between submarkets. The analysis shows that between 55 and 90 per cent of households moving within a submarket are trading up, with the remainder moving downmarket (a feature of the West and South submarkets in particular). However, while trading up typically characterises *intra*-submarket migration, households moving *across* submarkets are typically trading down. Jones *et al*. (2005) suggest this may be because it is something that is more easily done by moving to a new neighbourhood and would include buying a dwelling in need of substantial refurbishment. However, they also point out that households moving out of Glasgow city to the suburbs – a migratory journey typical of younger households with expanding families – and who would be more likely to be trading up, are excluded from this analysis. Despite this significant limitation, the study concludes that "the nature of submarket price structures / supply constraints militates against households moving to another submarket to trade up within the city" (Jones *at al*., 2005:229) and substantiates the view that planning for housing needs "to take some account of housing market dynamics from the bottom up" (ibid.:230). The optimal

manner of doing this is through “a framework of submarkets nested within a system of housing markets” (ibid.:230). Their argument is based not only on the advantage of using functionally-defined areas, but also on the evidence of the longer term existence of more stable submarkets and the potential for applying clustered household migration analysis to help address the data and resource constraints presented by hedonic analyses. The study of Glasgow, indeed has added an additional test for submarket identification using household migration analysis by examining internal coherence across price bands.

Overall, Jones *et al*. (2005) conclude that analysing submarkets on the basis of household migration provides a significant advantage over analysis based purely on intra-urban house prices. It *explicitly* recognises that demand-side influences can often be more powerful in determining movements in house prices than supply-side factors, although the authors recognise that analysis would be enhanced with the socio-economic and demographic data on migratory households and additional details on the housing stock.

The study of the Glasgow housing system and its six submarkets demonstrated a migration system with high levels of self-containment that provide broad support for the chosen submarket framework. However, the more detailed disaggregation by price band and trading up / down indicates a complex decision-making process whereby households adjust their housing choices to reflect the supply constraints. This is illustrated by the very significant difference in price increases across housing submarkets (e.g. 46% in the West submarket compared to only 8% in the Southwest between 1985 and 1997), a difference that clearly indicates excess demand in the West. Planning for housing needs to be able to identify and respond to these kinds of market outcomes, which are to varying degrees influenced by the planning system. An appropriate level of disaggregation supported by the relevant data is important because households wanting to move to a detached or semi-detached home in the suburbs are very different from those wanting to by inner-city apartments. Different types of housing are not necessarily close substitutes and as the Glasgow study demonstrates imbalances between supply and demand within submarkets tend to be reflected in differential price trends rather than being diffused across the housing

market as a whole. In this context the concept of submarkets and the disaggregated household migration-based analysis provide a very useful framework for monitoring and decision making in relation to planning for housing.

In a more recent academic paper that examines the contribution of economic concepts to the understanding how housing markets operate, Watkins (2008) revisits the issue of how best to define and delineate submarkets. In the context of renewed interest in neighbourhood segmentation and the complex processes shaping urban spatial structures engendered by improved statistical techniques and conceptual models, Watkins provides a discursive overview of the origins and evolution of the economic theory underpinning the concept of submarkets.

Highlighting that the juxtaposition of areas of high demand and acute affordability issues with low-demand neighbourhoods and the need for urban renewal reinforces the need for a better understanding of the dynamics of local housing markets, Watkins (2008) is implicitly critical of the proposition by Gibb (2003) that the operation of local housing markets can be better understood merely by applying quantitative modelling techniques to more comprehensive spatially coded datasets (see section 2.3.2). Bramley and Leishman (2005) had also observed that there continued to be "a lack of robust and reliable information on local housing markets at the local and neighbourhood level" (p.4), but for Watkins (2008) additional information *per se* is insufficient. "There are significant conceptual challenges that need to be addressed… It is not enough to rely on technical improvements to provide an enhanced understanding of the complex working of urban housing systems" (p.164). In particular, Watkins (2008) argues the case for a more pluralist approach to understanding housing markets with a greater emphasis on qualitative analysis that could be used to improve the specification and refinement of quantitative models and returned to this theme some years later in the context of Istanbul, Turkey, where analysis indicated that 'expert-defined boundaries' provided a robust qualitative alternative to standard hedonic methodologies where data was limited (Keskin and Watkins, 2017).

Echoing Jones *et al*. (2003; 2004), Watkins (2008) is critical of the unrealistic behavioural assumptions of the 'mathematically elegant' quantitative models of

housing market outcomes (e.g. house prices paid) and recommends a greater emphasis on examining the processes by which these outcomes are achieved. Thus, Watkins advocates a return to a more 'institutional' approach that recognises the market as an institution strongly influenced by its historical and spatial context and where social norms are an important determining factor in the behaviour of economic agents. This perspective places more emphasis on understanding underlying market processes and draws on the concept of 'filtering' as an important factor in the evolution of submarket.

This approach is already reflected in the studies by Jones *et al*. (2003; 2004 and 2005) that explore the role of household migration and new housing supply in explaining the process of housing market adjustment and captured in house price trends that vary significantly across housing submarkets. In this context, Watkins (2008) further refines the definition of a submarket as comprising "properties (and locations) that are likely to represent relatively close substitutes to consumers searching for dwellings. They have both spatial and structural (dwelling type) dimensions" (p.168). On the supply side, therefore, submarkets reflect qualitative differences in neighbourhoods and dwelling type and, on the demand side, the socio-economic and demographic characteristics of households and their particular preferences. In turn, differences in house prices and their trends reflect the specific combination of factors in each submarket, in particular, excess demand (and a shortage of supply) in higher quality neighbourhoods evidenced in rising prices and, conversely, in low demand run-down neighbourhoods in static or falling prices. Drawing on the work of Adair *et al*. (1995), Maclennan and Tu (1996), Jones *et al*. (2005), Watkins (2008) notes that British cities typically have between six and ten distinct submarkets and that these are relatively stable over longer time periods despite the impact of migration and new supply. This observation echoes the study of American cities undertaken by Rothenberg *et al*. (1991). Factors that contribute to this longer-term stability in the spatial framework of submarkets and the price differentials that characterise them include, on the supply side, the inability of developers to react to localised increases in house prices because of constraints imposed by the planning system. However, there is research to indicate that even in neighbourhoods where the supply of new

homes is relatively substantial the effects on house prices is fairly limited as prices are largely determined by the second-hand market (Leishman and Watkins, 2004).

On the demand side, too, Watkins (2008) highlights the limited evidence for households seeking to benefit from lower prices by moving to other submarkets (Jones et al., 2005; Kauko, 2001). This arises partly from the expectation of rising prices in their current location, but also because of the transaction and search costs of relocation (Maclennan, 1982) and a more general neighbourhood attachment. Price structures in submarkets are also influenced by information flows, not only those generated by estate agents in terms of the way they distribute housing market information, but also by valuers and solicitors, who help shape the pricing and bidding strategies of buyers and sellers (Smith *et al*., 2006) and may act to reinforce submarket price differentials. Watkins (2008) emphasises that all of these social and institutional factors work against the process of spatial arbitrage that should, according to mainstream economic theory, remove significant price differences in prices between submarkets through an ongoing process of market adjustment.

Watkins (2008) concludes that the "weak conceptualisation of local housing markets leads to serious analytical and operational difficulties" with no "clear consensus on the best way to identify meaningful, distinct neighbourhood clusters" (p.171), but takes heart from a number of recent developments. These include the use of advanced spatial econometric techniques to gain insights into neighbourhood-specific factors impacting on housing market performance. Clapp and Wang (2006), for example, use Classification and Regression Tree [CART] analysis to group neighbourhoods into homogenous submarkets on the basis of the impact of 'hard' boundaries (administrative boundaries and school catchment areas) and 'soft' boundaries (emerging from market interactions) on the behaviour of economic agents that result in discontinuities in the geography of house prices. Kauko (2004) advocates the use of neural network techniques to analyse the dynamics of neighbourhood housing markets. On the basis of a case study of Amsterdam, Kauko suggests that this approach lies somewhere "between simple equilibrium frameworks and more complex behavioural institutional frameworks" (p.2576), but

that its 'fuzziness' potentially provides a useful way to deal with the inherent complexities of urban housing markets.

Watkins (2008) sees in these developments significant progress towards developing analytical techniques that, despite ongoing lack of definitional clarity surrounding housing submarkets, do still "capture the behavioural and spatial complexity of the market" (p.173). He also regards the attempts by housing economists to include the behavioural factors that encourage submarket inertia rather than market equilibrium into mainstream quantitative analysis that is more realistic in behavioural terms as positive, as well as an analytical trend that has seen renewed interest in an institutional analysis of housing problems (Wallace, 2004; Needham and Segeren, 2005). Hence, Watkins (2008) argues that the future development of economic models of urban spatial structures and their application is likely to benefit from a better understanding of the behaviour and interactions of economic agents. Future microeconomic studies of housing markets should build on the work of Kauko, Wallace and others that place the analysis of market change within a more complex, and less abstract, social and institutional context" (Watkins, 2008:174), drawing on insights from a range of methodological perspectives, quantitative and qualitative.

2.4 Conclusion

This chapter has examined in some detail a very diverse body of academic literature that provides the theoretical framework for modern housing market analysis. The chapter contained two main parts. The first part (Section 2.2) examined the most important economics-based theories that ultimately provide the theoretical foundation for functionally defined housing markets and highlighted the processes of commuting, migration and house price formation that provide key elements of the operationalisation of these theories in the context of housing market analysis. It also examined the computer simulation models that contain elements of both the access-space and filtering models and helped to invigorate the systems approach that is fundamental to functional housing market analysis. The second main part (Section 2.3) outlined and critiqued the academic literature on functional housing market analysis emphasising how basic economic concepts of the market, submarkets and

spatial arbitrage have been operationalised in the context of planning for housing in the UK by means of the journey to work, household migration and hedonic pricing.

The access-space model, focuses on the trade-off between residential location and the journey to work (encapsulated by the distance decay curve). In many ways it provides the ultimate economic foundation for functionally defined housing markets. The evaluation of the access-space model highlighted its sensitivity to the simplistic assumptions underpinning it. Its assumption of a monocentric spatial structure clearly does not reflect the reality of most modern cities. Its assumptions in relation to market equilibrium and its inability to accommodate the durability of housing are also issues attracting significant criticism in attempts to explain urban structures that clearly reflect a considerable degree of path dependency. Nevertheless, academic critics of the access-space model accept that it does provide useful insights into the dynamics of urban housing markets (into, for example, the process of suburbanisation) and there is a substantial amount of empirical evidence to support the distance decay function that lies at its heart.

Filtering models recognise the segmented nature of housing markets in the real world, markets that are characterised by varying degrees of disequilibrium and focus on the relationship between new and second-hand markets and the household migration patterns that connect them. The model has been criticised in relation to its underlying assumptions with regard to consumer behaviour, its lack of definitional clarity and its potential negative impact on housing policy. It has also been criticised for giving insufficient emphasis to housing supply and the constraining influence of land use planning in its conceptualisation of the dynamics of the housing market. However, its emphasis on the triangular relationship between dwellings, households and migratory flows in the context of urban housing markets and on the inter-dependency of its component parts should be seen a key step forward in the evolution of housing market analysis, and in particular the concept of submarket.

The chapter also examines the important role played by hedonic modelling in housing market analysis, and in particular in the identification of submarkets. Hedonic modelling has as its point of departure the heterogeneity of both dwellings and consumers. The literature review indicates that there is little academic disagreement

with regard to the overall concept of hedonic modelling and, in broad terms, the analytical process that reveals the implicit price of individual dwelling attributes. However, the approach has been the subject of considerable criticism for both theoretical and practical reasons. The model's theoretical weaknesses include the classic 'identification' problem (it is impossible to disentangle the effects of supply and demand when analysing house price data) and its assumptions of market equilibrium and perfect information on the part of buyers. Practical issues include reliance on readily available data that can lead to misspecification, insufficient attention to attribute quality and inappropriate functional form. Despite these criticisms, however, when applied skilfully the evidence suggests that hedonic modelling does provide a basically sound and pragmatic approach to identifying housing submarkets.

Housing market simulation models have harnessed the tremendous increase in the processing power of computers. These algorithm-based models recognise the complexity of housing systems and the interdependency of their component parts and the factors underlying their operation – characteristics that are fundamental to the analysis of functional housing markets and submarkets. They have been used as a framework for considering the short-term dynamics of the market and the potential impact of policy interventions and are undoubtedly useful as analytical tools to inform housing and planning policy debates. However, the amount of data required and the need for constant updating, inherent data weaknesses, model complexity and the somewhat 'black box' approach that characterises these models combine to limit their usefulness in the real housing policy and planning world.

The second of the chapter (Section 2.3) turned to what in many ways provides the definitive theoretical framework for the thesis: the academic literature on the definition and delineation of functional housing market areas (HMAs) and housing submarkets. The relatively narrow body of academic literature on HMAs focuses on research undertaken in Scotland and England. It highlights the importance of recognising a housing market as a system of interconnected and interdependent parts and tenure as the most significant basis for disaggregation as well as the key role played by household migration. The literature that focuses more specifically on

the definition and delineation of HMAs is consistent in its view that administrative boundaries are an inappropriate framework for housing analysis. It also agrees on the importance of the underlying concepts of the 'market', 'spatial arbitrage' and 'substitutabilty'. However, in relation to operationalising the process of defining and delineating HMAs, there are some significant disagreements. Some of these may partly be due to differences in data availability. In Scotland, for example, the Register of Sasines has proved to be a valuable data source that is unavailable in the rest of the UK. However, while academics agree that there is a role for commuting patterns, housing search, household migration patterns and levels of market self-containment, the divergence in terms of methodological detail indicates not only the complexity and 'variegated' nature of the housing market, but also a certain lack of conceptual and definitional clarity. This is reflected in the apparent definitional blurring between HMAs and housing submarkets and an increasingly complex tiered approach that characterises the more recent academic contributions and in many ways militates against the adoption of a functionally-defined HMA framework for the analysis of future housing requirements.

The theoretical propositions underpinning the definition and delineation of housing submarkets have the same origin in economic theory as HMAs, namely spatial arbitrage. However, submarkets develop because of constraints on the process of arbitrage (transaction costs, inadequate information or planning constraints) within the context of an HMA, whereas HMAs are characterised by internal spatial arbitrage and the absence of spatial arbitrage and substitutability between HMAs. The implicit assumption of market equilibrium in the hedonic modelling approach to submarkets and its focus on outcomes rather than processes has given rise to the call for this essentially econometric approach to be supplemented by an analysis of household migration patterns that will contribute to the rationale for the chosen submarket boundaries. Based on this analysis, there is empirical evidence suggesting that migrant households remaining within the boundaries of submarkets are typically trading up, whilst those crossing submarket boundaries are trading down, an analysis that may be enhanced by analysis of demographic and socio-economic variables and further data on the dwelling stock. Some more recent academic contributions also

emphasise the need for an institutional approach that recognises the influence of historical factors within a specific spatial context as well as the benefits of more qualitative data that supplement both the hedonic modelling and analysis of patterns of migration.

What above all emerges from this chapter, however, is not only the complexity of the network of factors driving the dynamics of housing markets and submarkets, but that despite the awareness of the importance of tenure as a factor in understanding housing market dynamics there has been little emphasis on tenure-specific analysis. This is more than likely due to a large extent to the absence of suitable datasets, but nevertheless it must be regarded as a significant evidence gap that is encapsulated in the following research proposition:

Functionally defined housing market areas and submarkets provide a more meaningful spatial framework for housing market analysis and planning for housing. However, given the growing importance of the private rented sector, this framework needs to appropriately reflect any tenure-related differences in household migration patterns.

The three analytical chapters of the thesis (Chapters 5-7) will attempt to address this evidence gap. However, in advance of this, the next chapter will examine the policy context.

Chapter 3 The Policy Context

3.1 Introduction

The introductory chapter to this thesis highlighted the overall focus for the study: improving the evidence base for the process of housing market analysis that underpins planning for housing in Northern Ireland. It also highlighted the importance of a number of theoretical concepts developed by housing economists that have provided a better understanding of the definition and delineation of the housing market areas (HMAs) that constitute the spatial framework for analysing the evidence that supports the dual process of estimating future housing requirements and planning for housing supply.

Drawing on a cross-section of the wide-ranging academic literature that has emerged over the last 50 years, Chapter 2 examined four key economics-based theoretical models that have informed the process of modern housing market analysis: access-space models, filtering models, hedonic models and computerised housing market simulation models. It highlighted the journey to work, migration and price formation as key elements of the operationalisation of the definition and delineation of functional housing markets in the real world. This, together with the systems approach inherent in computerised housing market simulation models, provided the theoretical basis for a more detailed exploration of the somewhat limited academic literature on the process of housing market and submarket analysis that draws on these four models, and in particular the spatial framework for undertaking this analysis. These latter sections (2.5.1 and 2.5.2) highlight the fact that this academic literature focuses almost entirely on England and Scotland and that it is characterised by a lack of tenure-specific analysis – in particular analysis that gives sufficient weight to the dynamics of the private rented sector. It also suggests that one explanation for the difficulty of translating basically sound theory into policy and practice has been the lack of conceptual and definitional clarity with regard to HMAs and submarkets as well as the over complexity of some of the theoretical studies.

This chapter therefore re-examines these issues from the policy perspective. In doing so, it forms the second pillar of the theoretical and policy framework that underpins the overall study (Figure 3.1) and substantially addresses Objective 2:

> *"To evaluate the policy context and current spatial framework for estimating future housing requirements and supply in Northern Ireland in the light of the changing tenure composition of the housing market".*

The policy context and trajectory for housing market analysis in the context of the UK is examined by drawing on the more important strategic planning documents published in Great Britain and Northern Ireland over the past two decades. The evolution of the content of these documents confirms the growing emphasis on evidenced-based planning and the transition from Housing Needs Assessment to Housing Market Analysis (Local Housing Systems Analysis in Scotland) based on functionally defined housing market areas. The chapter examines the different approaches used in Scotland and England in some detail. However, there is a specific focus on the approach applied by Government in Northern Ireland to estimate future housing requirements, where responsibility for planning for housing at the strategic level has in recent decades been divided between four (since 2015 three) Government Departments: the Department for Infrastructure (formerly the Department for Regional Development), the Department for Communities (formerly the Department for Social Development) and the Northern Ireland Housing Executive. In addition, since 2015, eleven new "super" councils have been given responsibility for producing Local Development Plans, a major part of these are devoted to planning for housing at the local level.

More specifically, the chapter focuses on Northern Ireland's Regional Development Strategy and associated policy documents and reports (including those provided by the Housing Executive) that provide an insight into the methodology – and more specifically the spatial framework – for assessing the overall future need and demand for housing in Northern Ireland and the resultant Housing Growth Indicators (HGIs). However, the chapter begins by outlining the more general backdrop to the emergence of this policy documentation: the evolution of evidence-based policy and

planning and the ongoing challenges of applying economic evidence to the process of planning for housing.

Finally, the chapter also examines the factors that drove the rapid growth of the private rented sector during the first decade of the new millennium, emphasising the important role played by Government policy in this important structural change in the housing market.

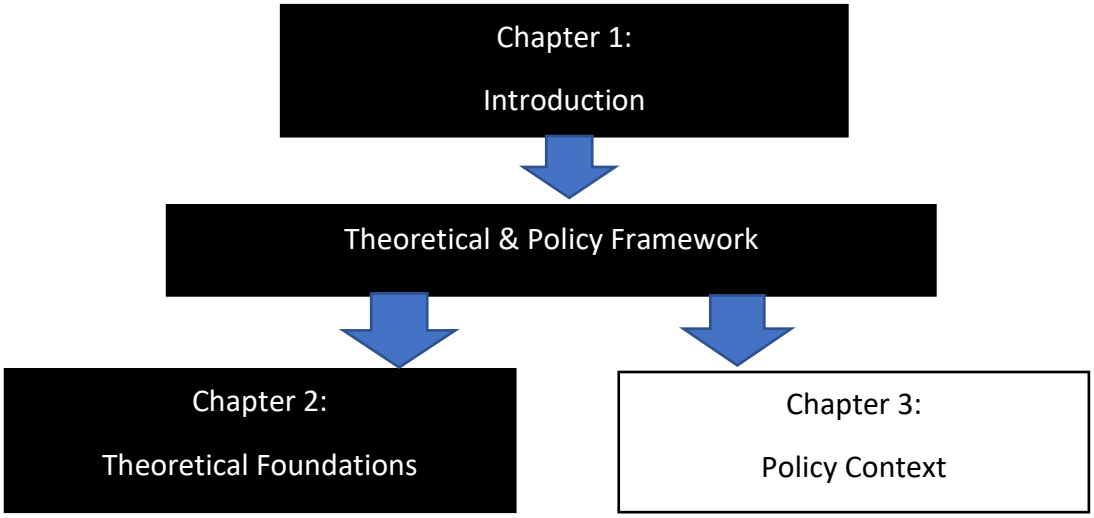


Figure 3-1 Chapter 3 in its structural context

3.2 Evidence-based Policy and Planning – the Use of Economic Evidence

The roots of evidenced-based policy and planning had can be traced back to the nineteenth century. Bulmer (1982) viewed the Royal Commission on the Poor Law (1832-34) as the "first dramatically obvious instance of the use of social research in policy making" (cited in Nutley and Webb, 2000:16). The role of statistics and research in terms of guiding UK Government policy expanded significantly in the 20th century as survey techniques became more and more sophisticated. However, evidence-informed policy and practice (EIPP) only emerged as a concept in the late 1990s "in response to sustained political pressure on public service providers to demonstrate that they were providing both good quality and appropriate services" (Anderson and Bennett, 2003: xv). This 'apotheosis' of evidence-based policy was reflected in a key philosophy of the Labour Government elected in 1997: 'what matters is what works', which Davies *et al*. (2000:1) considered "a conscious retreat from political ideology".

This 'New' Labour philosophy found its expression in a number of key Government documents, including the *Modernising Government* White Paper, which advocated the "better use of evidence and research in policy making" (Cabinet Office, 1999a, para.2.6). In addition, the Strategic Policy Making Team in the Cabinet Office published a report entitled *Professional Policy Making for the Twenty-First Century*, which emphasised that "policy decisions should be based on sound evidence" and that "good policy making depends on high quality information" (Cabinet Office, 1999b, para.7.1).

This growing Government emphasis on evidence-based policy was further reflected in an 'evidenced-based turn' in spatial planning in the early 2000s (Baker and Wong, 2006; Faludi and Waterhout, 2006) that harked back to the Geddesian 'survey-before-plan' approach. However, while the underlying concept itself represented nothing very new in the planning world, its application in the sphere of planning policy and practice changed significantly in that it increasingly "operates through evaluation studies, works with indicators, and tries to spread good practice" (Faludi and Waterhout, 2006:9).

However, contrary to what the Cabinet Office publication might suggest, Faludi and Waterhout argue that "evidence-based planning is a political process" (ibid.:10). Davoudi (2006:22) also views the current enthusiasm for evidence-based policy as being based on an '*instrumental model*' that pre-supposes that "complex political and socio-economic processes" are "technicised, commanded and controlled" by means of a scientific process. Davoudi (2006:16) illustrates this with reference to planning policy issues such as urban containment and high density developments to achieve sustainable communities and concludes that any evidence base is best viewed in the context of an '*enlightenment model*' that aims to "illuminate the landscape within which policy decisions have to be made".

In a more recent article that draws on the experience of policy development under 'New' Labour throughout the first decade of the new millennium, Bannister and O'Sullivan (2014) also emphasise the importance of politics. They argue that the relationship between evidence and policy is significantly influenced by the specific policy issue being addressed and the point in the policy cycle at which this

relationship is being examined. It is also heavily influenced by context, including the availability of resources and time. Bannister and O'Sullivan highlight the 'eclectic nature' of New Labour's interpretation of 'evidence' that included, for example, expert knowledge, stakeholder consultation and economic or statistical modelling. Using the evolution of Antisocial Behaviour (ASB) policy as a case study, they conclude that "the underlying political milieu has been shown to form a relevant context conditioning the relationship between policy and evidence" and that 'phronetic evidence' (subjective knowledge) plays an important role in reinforcing community views and enables policy to be seen as "responding strongly to the democratic imperative" (Bannister and O'Sullivan, 2014:87).

In the early 2000s, the issue of land use regulation (planning) and its impact on housing markets and housing supply emerged as a key policy issue. Chapter 2 of this thesis (2.3.2) outlined the background to this from the perspective of housing market analysis, but the lack of economic analysis underpinning, more specifically, the process of planning for housing emerged as an issue highlighted in a number of studies. Cullingworth (1997:951), in a seminal contribution, had already noted that "economic analysis plays a very minor part in land use planning"; a point also emphasised by Evans (2003), who observed that he was unaware of any evidence of planning in practice been significantly influenced by input from any economists.

In a similar vein, O'Sullivan (2003) is also critical of local authority planners in Great Britain at that time, who had a statutory obligation to produce local housing strategies that, in principle at least, required the application of a considerable amount of economics. However, drawing on research undertaken, for example, by Blackaby (2000), O'Sullivan (2003:225) verified that "the economic content of land use planning is very limited" and that future household numbers are established using demographic projections with little attempt being made to incorporate economic influences. Indeed, he concluded that local housing strategies tend to be 'silent or superficial' in terms of how they address private housing issues, and in their use of economic analysis to understand past trends, present conditions and future developments.

O'Sullivan (2003) highlighted a number of specific ways that economists could contribute to the development of more meaningful local housing strategies, including helping to draw up functional boundaries for local housing markets and analysing their underlying determinants (the structure and evolution of local labour markets), modelling household formation, housing demand and tenure choice, underpinned by the satisfactory representation of local labour markets (including migration forecasting).

However, for Jones *et al*. (2005), it was hardly surprising that there was a disconnect between academic economists and planning professionals. "Mainstream urban housing economists have based much of their empirical work on local housing markets on the access-space trade-off model ... or highly aggregated econometric and simulation models.... (both) predicated on patently unrealistic assumptions about the operation of the housing market" (Jones *et al*., 2005:215). Echoing O'Sullivan (2003), Jones *et al* (2005) also highlighted the contribution economic analysis can make to a more sophisticated analysis of future housing requirements, but emphasised that the chosen approach should be "based on a framework that relates better to the operational and structural divisions within the markets" (Jones *et al*., 2005:216).

By the early years of the new millennium, therefore, it was clearly evident (and reflected in the academic literature of that time) that despite the increasing market-orientation of the housing system in the UK, the planning process used to estimate future housing needs had at this stage paid insufficient attention to market signals, such as house price increases, and that overall "the economic content of land-use planning and associated analyses... remained rather modest" (Ferrari *et al*., 2011:394).

3.3 Evidence-based Planning: Policy Transition to Housing Market Analysis

Nevertheless, by the start of the new millennium, it was apparent that Government was beginning to place more emphasis on evidence-based policy and planning, reflected by a range of strategic planning documents produced in both England and Scotland. Increasingly, too, this documentation began to give more credence to the

academic critique that had highlighted the need for economic evidence to be used by strategic planners to support the planning for housing process.

3.3.1 Early developments in Great Britain

The market-orientated approach to planning that characterised the Thatcher administration resulted in an almost complete neglect of strategic regional planning during the 1980s (Hincks *et al*., 2013). This changed to a certain extent with the publication of Regional Planning Guidance (DoE, 1992), during a period when planning for housing at the local level was characterised by the use of demographic projections based on past trends of household formation and migration to determine the amount of land set aside for future housing developments (Bramley, 2013). However, it was only with the publication of the Labour Government's Planning Green Paper (DTLR, 2001), which not only clearly recognised the role of planning in promoting economic prosperity, but also emphasised the need for regionally based policies in relation to planning the scale and distribution of new housing, that evidence-based regional strategic planning for housing was rehabilitated.

The Planning Green Paper set out what was in essence a blueprint for a major reform of the planning system in England (Hincks *et al*. 2013) and culminated in 2004 in the introduction of a new system of planning that envisaged the development of 'Spatial Plans' rather than merely land use plans as the key outputs from the development planning process. This re-orientation was to be reflected in spatial planning that would "bring together and integrate policies for the development and use of land with other policies and programmes which influence the nature of places and how they function" (ODPM, 2004, para.1.8).

The 2004 reforms also saw Planning Policy Guidance Notes (PPGs) being replaced by Planning Policy Statements (PPSs) to guide the implementation and delivery of the new concept of spatial planning. In addition, new statutory Regional Spatial Strategies (RSSs) were to be produced by new regional planning bodies and sub-regional planning was to become part of the new Regional Spatial Strategy framework. This new process of planning for housing at the strategic level was to be underpinned by what Hincks *et al*. (2013:128) characterise as "more sophisticated

market-informed and spatial analytical thinking, and more effective collaborative and institutional and governance arrangements at the regional scale".

This reawakened focus on evidence based planning for housing in England was reflected at the local level in *Planning Policy Statement (PPS) 12: Local Development Frameworks*, issued by the Office of the Deputy Prime Minister, which stated that local planning authorities should "prepare and maintain an up-to-date information base on key aspects of.... their area, to enable the preparation of a sound spatial plan" (ODPM, 2004:32). Independent panels were to examine these spatial plans on the basis of a number of criteria, including whether they are "founded on a robust and credible evidence base" (ibid.:39), a point that was re-emphasised in an updated version of *PPS12*, which stated that each local planning authority should have a core strategy "founded on a robust and credible evidence base" (DCLG, 2008:20).

The year 2004 also witnessed the publication of the Final Report on the *Review of Housing Supply* (Barker, 2004). Chapter 2 (Section 2.3.2) of this thesis highlighted the background to this report that has proved to be very influential in policy terms. Indeed, with hindsight, Bramley (2013) considers the Barker Review to have played a critical role in bringing the issue of housing supply to prominence in the context of escalating affordability problems and the apparent inability of the private sector to provide an adequate response. Noting that the housing market had contributed significantly to macroeconomic volatility, one of the Review's overall objectives related to the "location of housing supply which supports patterns of economic development" (Barker, 2004:4). In achieving this, the report recommended that planning should take more account of 'market signals', and in particular information relating to house prices and consumer preferences. A key recommendation was that decisions on the scale and distribution of housing numbers should be informed by sub-regional and local housing assessments.

Adams (2011) highlights the controversial nature of what was perhaps the key conclusion of the Barker Report – that the above average rate of increase in house prices and significantly worsening affordability for first-time buyers was largely attributable to a restrictive planning system and could, therefore, be alleviated by releasing significantly larger amounts of land for housing. Housing economists are

still divided on the extent to which house price inflation would be more controlled and affordability improved if there was a much higher level of new housing construction (Leishman, 2015). Regardless of this, however, the Barker report must be regarded as a watershed in terms of planning for housing, in that it signified a new policy emphasis on economic evidence in the process of estimating future housing requirements.

One of the clearest manifestations of the growing emphasis on economic evidence-based planning for housing has been the transition in policy and practice from Housing Needs Assessment, with its narrower focus on measuring housing need as a basis for developing a programme for building new social dwellings, to Housing Market Analysis, a more market-based approach, which explicitly recognises that the social sector is not isolated from the wider housing market or developments in the local economy in general (Ferrari *et al*., 2011). The first steps in this transition emerged in Scotland during the 1990s with the development of the Local Housing System Analysis (LHSA) approach to planning for housing in Scotland. This more systematic, holistic approach explicitly recognised that housing was part of a wider economic, social and political environment (O'Sullivan *et al*., 2004). Appositely, it highlighted the need for a much more comprehensive evidence base, and in particular emphasised the importance of the underlying economic factors, which were reflected in guidelines advocating the use of functionally-defined housing market areas as the strategic spatial framework for analysis of the evidence rather than the 'somewhat arbitrary' local authority boundaries (ibid.:40). In Scotland, the use of housing market areas was seen as providing "an established basis for calculating the housing land requirement" (Scottish Executive, 2002:5), with an HMA being defined on the basis of the self-containment criterion that "a large percentage of the people moving home or settling within it have sought a dwelling only within that area" (ibid.:5).

However, whereas Scotland had already witnessed a transition to Housing Market Analysis in the 1990s, in England it really only emerged in the 2000s (Baker, 2010). The first real evidence of this in terms of Government guidance was the Department of the Environment, Transport and the Regions' *Local Housing Need Assessment – A*

Guide to Good Practice (Bramley *et al*., 2000), which emphasised that a local housing strategy was not only concerned with investing public money in social housing – although this did remain an important concern. Local housing strategies also had to consider "the potential contribution of new private housing and of existing housing in all tenures, to the meeting of current needs and preferences" (ibid.:9). Nevertheless, assessing the need for social housing remained the focus of this manual and guidance on how to undertake an analysis of the local housing market was limited (Palmer, 2007).

This lack of guidance was addressed much more explicitly in the Office of the Deputy Prime Minister's *Housing Market Assessment Manual* (DTZ Pieda Consulting, 2004), which made it clear that planning for housing was an integral part of a broad range of local authority activities, including economic development, and 'supra-council partnership working'. Housing Market Assessment was regarded as "a framework to analyse the supply/demand dynamic at the sub-regional level… it is anticipated it will cover more than one local authority boundary" and "based upon information about the sub-regional housing market and broad travel areas… partners need to try to determine which grouping of local authorities boundaries operate as a housing market area" (ibid.:3, 17).

3.3.2 Developments in England: Strategic Housing Market Assessments

Implementation of the new guidance on Housing Market Assessment in England was complemented by provisions in the Planning and Compulsory Purchase Act (2004), which laid the foundations for radical changes to the Development Plan system in England. New Regional Spatial Strategies were to provide the framework for land use planning at the local level and were to include estimates of the scale and distribution of new housing provision. These new spatial strategies acknowledged explicitly that local authority boundaries were not the optimum spatial framework for undertaking housing market analysis by transferring leadership of the process to regional assemblies and sub-regional partnerships (Palmer, 2007:20).

In November 2006, the Department for Communities and Local Government (DCLG) published its response to the Barker report: a new Planning Policy Statement (PPS 3)

that aimed to deliver "the necessary step change in housing delivery, through a new, more responsive approach to land supply at the local level" (DCLG, 2006:5). PPS 3 stated that Local Development Documents and Regional Spatial Strategies should be informed by a "robust shared evidence base, in particular, of housing need and demand, through a Strategic Housing Market Assessment" (ibid.:7). Local planning bodies were to give due regard to "market information" and "housing market areas in developing their spatial plans" (ibid.:7). These housing market areas had to reflect "the key functional linkages between places where people live and work" (ibid.:27).

The following year, DCLG also issued a new manual entitled *Strategic Housing Market Assessments: Practice Guidance* (DCLG, 2007a). The document viewed Strategic Housing Market Assessments (SHMAs) as a key component of policy development and resource allocation by "enabling regional bodies to develop long-term strategic views of housing need and demand to inform regional spatial strategies and regional housing strategies" (ibid.:7). The spatial framework for analysing housing need and demand was envisaged as a patchwork of sometimes overlapping HMAs that could require co-operation with other local authorities in a sub-regional HMA.

In parallel to this DCLG published an advice note entitled *Identifying sub-regional housing market areas* (DCLG, 2007b). It emphasised the importance of understanding how housing markets work and the spatial pattern of housing demand resulting from travel to work patterns. Adopting the same functional definition of housing market areas based on household demand and preferences that had been set out in its manual on SHMAs (DCLG, 2007a:8), the advice note identifies key sources of information (including house prices, household migration and search patterns and contextual data such as TTWAs), that can be used to define housing market boundaries[7] (DCLG, 2007b). However, although this fairly detailed document is firmly rooted in the HMA theoretical foundations (as depicted in Chapter 2, Section 2.3), Hincks *et al*. (2013) are critical that it did not offer firmer recommendations in

[7] Analysis of house prices, which are seen as a "market-based reflection of housing market area boundaries", provides an indication of the differential prices people are prepared to pay for similar housing. Household migration and search patterns reflect a combination of economic, social and environmental factors, with migration flows helping to identify these relationships. A housing market area is one "within which a relatively high proportion of household moves (typically 70 per cent) are contained" (DCLG, 2007b:7,9).

relation to the utilisation of the three key data sources (TTWAs, house prices and household migration and search patterns). Importantly, Hincks *et al*. (2013) suggest that this degree of flexibility afforded to the local and regional planning bodies in terms of defining sub-regional HMAs as having led to competing definitions, which in turn has resulted in uncertainty in the practical application of HMAs in the process of housing market analysis, and an ambiguity that has damaged the reputation of Strategic Housing Market Assessments (Ferrari *et al*., 2011).

The General Election of May 2010, like the publication of the Barker Review in 2004, may also be considered a significant turning point in terms of strategic planning in England (Hincks *et al*., 2013). The Global Financial Crisis (2007/08) and the associated economic crisis had a profound negative impact on the UK housing market as a whole and must be viewed as the single most important factor triggering the significant political change that happened in the UK towards the end of the first decade of the new millennium. The newly elected Conservative-led coalition that replaced the Labour Government made a number of discernible changes to the planning system that had important consequences for the planning for housing process at the strategic level. In particular, the strategic regional planning function and associated institutions were abolished as part of the new Government's 'localism' agenda that sought to "return decision-making powers on housing and planning to local authorities" (HM Government, 2010:11). In parallel, top down targets for new housing supply at the regional level were abandoned and the Planning Policy Statements, introduced by the Labour Government as part of its 2004 reforms, were replaced by a new National Planning Policy Framework (Hincks and Baker, 2012). The National Housing and Planning Advice Unit (NHPAU)[8], which was the key source of the Government's top down housing targets, was also abolished in 2010 as part of the rationalisation of CLG by the new regime.

[8] The NHPAU was established in 2006 in response to the Barker Review as a "non-departmental public body, sponsored by Communities and Local Government, designated to provide independent advice on affordability matters to the Government, Regional Assemblies and other stakeholders with an interest in the housing market".
http://webarchive.nationalarchives.gov.uk/20081212144037/http://www.communities.gov.uk/nhpau/

The National Planning Policy Framework (NPPF) published by DCLG in 2012 was portrayed as a step change in planning policy that would create a planning system to support sustainable development 'without delay'. This was to be facilitated by a "presumption in favour of sustainable development" as the "basis for every plan and every decision" (DCLG, 2012:i) The NPPF was designed to replace the existing voluminous planning policy documentation with around 50 pages of guidance, written in a simple and clear style that would facilitate greater community involvement in the planning for housing process.

In relation to planning for housing, a core principle was to 'objectively identify' the need for market and affordable housing in order to significantly boost the supply of housing and in doing so take account of market signals (including land prices and the affordability of housing) and put in place a strategy for setting aside the requisite acreage of land required. This process would include identifying 'specific deliverable sites'[9] sufficient for ensuring a five year supply of housing for the requirements set out in the housing strategy, plus an additional amount (5-20 per cent where there has been persistent undersupply) to ensure choice and competition in the market for land.

Significantly, the NPPF reaffirms the importance of preparing a Strategic Housing Market Assessment (SHMA) and "working with neighbouring authorities where housing market areas cross administrative boundaries" (DCLG, 2012, para.159). The NPPF also tasks local authorities with identifying the scale and mix of housing and the range of tenures that the local population is likely to need over the plan period based on demographic projections, as well as with preparing a Strategic Housing Land Availability Assessment to establish realistic assumptions about the availability, suitability and the likely economic viability of land to meet the identified need for housing over the plan period. By implication, this meant that the HMA framework that had underpinned the SHMAs was still seen as a viable tool in the process of gathering housing market intelligence (Hincks and Baker, 2012).

[9] "To be considered deliverable, sites should be available now, offer a suitable location for development now, and be achievable with a realistic prospect that housing will be delivered on the site within five years and in particular that development of the site is viable" (DCLG, 2012, para.47).

Ferrari *et al*. (2011) provide a comprehensive insight into, and critique of, the evolution and practical application of SHMAs in England during the 2000s. They identified SHMAs "as a central part of the evidence base designed in particular to ensure that the wider housing system, including the market for owner occupation, was considered in a more meaningful way than had historically been the case in housing need studies and housing plans" (Ferrari *et al*., 2011:395). Their critique is based on a review of a broadly representative sample of 21 SHMAs out of an estimated total of 80 published or adopted in England by 2009 (NHPAU, 2010). The sample was drawn to ensure differences in scale by differentiating between those commissioned by local authorities ('lower-tier SHMAs') and those undertaken at a sub-regional level on behalf of groups of local authorities or regional bodies ('upper-tier SHMAs').

Ferrari *et al*. (2011) use a number of evaluation criteria to guide their critique. Conceptually, SHMAs were evaluated by examining whether they had used a spatial framework for analysis that reflected market structures and processes, i.e. functional boundaries, rather than administrative ones, whether they had recognised the existence of submarkets reflecting house price/rental differentials in different segments of the market (allowing for dwelling type and locational quality differences) and, citing Watkins (2008), had recognised the importance and interaction of both supply and demand, rather than simply focussing on property prices.

Methodologically, the SHMAs were assessed against a number of criteria to determine whether they were consistent in terms of good practice in social research (transparency, replicability and inferences accompanied by confidence intervals). Finally, in this regard a number of process related criteria were highlighted, including, for example, the need to establish cross-boundary housing market partnerships, and the need to contribute in a meaningful way to the development of policy related to planning for housing, for example, by clearly recognising the heterogeneity of demand for housing and an operationalisation of the conceptual distinction between housing 'need' and 'demand'. According to Ferrari *et al*., (2011:401/2) High quality SHMAs should therefore have exhibited "definitional and conceptual clarity",.. have been "robust in methodological terms",.. and have been drawn up "using processes

designed to ensure that the evidence is comprehensive" presented in an "open and transparent manner" and can be "translated into policy".

The findings of this important study (Ferrari *et al.*, 2011) indicated that despite being shaped by official guidance, the actual SHMAs were of mixed quality when assessed against the three categories of criteria. Conceptually, there was, in the first place, limited evidence of the application of functional HMA principles in a consistent way. Typically, upper-tier SHMAs commissioned at sub-regional level paid scant attention to the wider HMA context, and functional boundaries that were identified had only limited significance in determining the actual boundaries used in the final SHMAs. In the North West region of England, for example, most local authorities framed their SHMAs within HMA boundaries that were "administratively and politically convenient", established through a process of stakeholder involvement that resulted in 'policy compromise' and more likely to be "coterminous with administrative boundaries than those developed using a purer empirical approach" (Ferrari *et al*., 2011:403; see Brown and Hincks, 2008, Chapter 2, Section 2.5.2).

However, while the majority of upper-tier SHMAs used existing regional or administrative boundaries, there were some instances – for example, in the East Midlands – where sub-regional SHMAs used HMA boundaries delineated in functional terms, using in the main the criteria of migration self-containment, were nested in a broader study that defined sub-regional housing markets (B-Line and Three Dragons, 2007). Similarly, in the case of lower-tier SHMAs the use of migration flows to define HMAs in functional terms was used much more consistently, but there were issues regarding scale, with local housing market areas being identified that could have been more appropriately defined as submarkets (Ferrari et al., 2011).

Secondly, most SHMAs did segment the identified HMAs into submarkets, and, given the absence of more detailed Government guidance, a range of methodologies were used, including in the case of lower-tier studies either existing administrative boundaries or neighbourhoods. The lack of consistency was reflected, for example, in the number of submarkets identified in the case of Nottingham (59) compared to Birmingham (6), a much bigger city. This bears out the contention expressed in Chapter 2 that there is clearly some conceptual confusion about what constitutes a

sub-regional housing market area and its constituent submarkets (Ferrari *et al*., 2011).

Thirdly, Ferrari *et al.* (2011) were conceptually critical of SHMAs in England in relation to the interaction and reconciliation of supply and demand. They noted that demand groups were normally well-defined, usually using tenure as a basic analytical framework, but also identifying other groups such as Black and Minority Ethnic (BME) households, older households or those with support needs and students. They argued, however, that the quantification of supply and demand and the evidence adduced for this is the most problematic feature of SHMA practice. Again, the lack of appropriate Government guidance is highlighted as a major cause of this, resulting in the use of a wide range of methods and data sources. Ferrari *et al*. (2011) criticise the use of migration data as a proxy for demand (as opposed to its use in defining HMA boundaries) because of the weak relationship between migration data (revealed demand) and effective (but unmet) demand. They consider unmet effective demand as the more important indicator when it comes to planning for future housing requirements. In contrast, migration data can be heavily influenced by supply constraints, and only really reflects effective demand when all households with the necessary purchasing power are able to buy (or rent) their optimal home in their location of choice. Using migration data as the basis for estimating future (effective) demand, therefore, can in effect create a circular weakness in the planning for housing process, with new supply attracting migrants unable to find a suitable home in another preferred area – an 'imperfect outcome' that is then compounded by being included as part of the evidence base for estimating future housing requirements (Bramley and Watkins, 1995). Given this inherent weakness, Ferrari *et al*. (2011) highlight the fact that more than half of the upper-tier and almost all the lower-tier SHMAs used migration data as a direct input to demand estimations, noting that even where demographic projections were used, these also contained migration estimates and consequently recommend that the use of bespoke primary housing search data should be explored.

This more detailed overview of a very important contribution to the academic literature on housing market analysis in practice by Ferrari *et al*. (2011) has focussed

on their critique of the conceptual and definitional clarity of the SHMAs produced in England in the 2000s. However, further criticism is levelled at the technical and methodological features of SHMAs, as well as the processes by which they are produced, including the impact of SHMAs on policy and the operation of housing market partnerships. Despite this criticism Ferrari *et al*. (2011:417) do not suggest that housing market analysis undertaken by planners on the ground should "be held to academic standards of rigour" or use "leading edge techniques developed by econometricians or spatial statisticians" or indeed follow one "single methodological template". However, what can be reasonably expected is conceptual clarity and consistency, a transparent and replicable exposition of the methodology employed and a demonstration of the linkage between analysis and policy. Ferrari *et al*. (2011:417) argued that there are significant conceptual weaknesses in relation to housing market definition, internal market structures and the relationship between supply and demand and that addressing this implies an enhanced role for central Government in terms of guidance. In relation to the issue of research methodology, there was a considerable 'opacity' and a lack of robustness in terms of statistical techniques. Finally, the study indicated that the analysis at the heart of the SHMAs was often not effectively connected to policy issues and concluded that, in order to ensure greater consistency overall, better guidance is required, as well as investment in developing the analytical skills of planners.

In parallel to the research undertaken by Ferrari *et al*. (2011) the NHPAU commissioned a multi-university team to undertake a research project that would develop a consistent geography of HMAs for England, with the objective of providing the planning for housing process with a clear spatial structure, and more specifically providing the basis for assessing the likely affordability outcomes of the various strategic options available for the location of new housing supply (Jones *et al*., 2010).

Stage 1 of this NHPAU research project (Baker, 2010) undertook a desk-based analysis of SHMA-related policy documentation for 8 of the 9 English regions, with the aim of analysing the different approaches being used to define housing market areas throughout England and their subsequent use in spatial planning at the regional level. This study like the one undertaken by Ferrari *et al*. (2011) concluded that while

most regions had undertaken work to identify sub-regional housing market areas, there was considerable inconsistency in terms of the various approaches to defining and delineating these HMAs and again highlighted inadequate Government guidance (specifically its 'openness', i.e. the lack of detail) as a major factor in this variation.

Like Ferrari *et al*. (2011), the study undertaken by Baker (2010) also highlighted the very significant differences in the number of HMAs used as the basis for strategic housing market assessment in each region, differences that are not purely explicable on the basis of the differing urban/rural characteristics of the regions. For example, in the North West there were 27 SHMAs compared with only 25 for the three regions of North East, West Midlands and Yorkshire and Humber all together (Table 3.1).

Table 3-1: Strategic Housing Market Assessments per region

Region	No. of Assessments
East of England	13
East Midlands	11
London	5
North East	4
North West	27
South East	23
South West	14
West Midlands	4
Yorkshire and Humber	17
Total	**118**

Source: Jones *et al*. (2010)

Baker (2010) identified additional methodological issues: most SHMAs had adopted a hybrid approach that reflected the most up to date Government advice (CLG, 2007a) with its emphasis on analysing household migration and TTWAs, some supplemented this with analysis of house price data; all SHMAS also undertook qualitative analysis based on stakeholder consultation. However, where housing market areas had been identified prior to regional analysis, there was a significantly higher level of methodological inconsistency, often resulting in overlapping boundaries, with the result that aggregation to form a consistent regional overview became impossible. HMAs generated tended to be based on local authority

boundaries or subsequently aligned with them for the purposes of SHMA though many housing market areas covered more than one local authority. However, the NHPAU study acknowledges the practical advantages of alignment in terms of: "accountability, delivery, data availability, and spatial planning policy preparation and the ease of establishing appropriate partnership working" (Baker, 2010:27), but emphasises the need to create effective partnerships to address shared housing market issues, with local authorities needing to be involved in more than one SHMA.

There can be little doubt that the lack of definitional clarity, the complexity of application and resultant inconsistency meant the initial enthusiasm for SHMAs based on functionally defined HMAs and submarkets that was apparent in the 2000s waned among policy makers and planners alike. This was reflected in the withdrawal of the guidance on Strategic Housing Market Assessment (DCLG, 2007a, 2007b) in 2014 and its replacement by 'new planning practice guidance'. Two documents are of particular relevance: *Housing and economic land availability assessment* (MHCLG, 2014) and *Housing and economic development needs assessments* (MHCLG, 2015). The former document, as the name suggests forms a key element in the evidence base underpinning development plans and policies to deliver the necessary land needed for housing and economic development and reaffirms that the geographical area covered by any assessment in relation to land availability should be the housing market area. Planners are then referred to the second document for additional guidance.

The guidelines on housing and economic development needs assessments were published by the Ministry of Housing, Communities and Local Government (MHCLG) in March 2015 with the aim of helping planning authorities to objectively assess and evidence the need for market and affordable homes and economic development. They continued to include the requirement to undertake a SHMA as required under the NPPF. Housing requirements were to be broken down by type, tenure and size and the housing supply required to meet that demand on the basis of a number of realistic future scenarios was to be identified. Local planning authorities were expected to carry out the assessment working "with the other local authorities in the relevant housing market area", because housing requirements are "rarely

constrained precisely by local authority administrative boundaries" (MHCLG, 2015:3). Requirements were to be assessed in relation to relevant functional area, i.e. a housing market area, which may include identifying small submarkets with specific features.

The guidance also provides a number of broad signposts in terms of defining and delineating HMAs[10]. These include, for example, house prices and the rates of change in house prices. House prices are seen as providing a 'market-based' indication of HMA boundaries based on the geographical differences paid by homebuyers for similar housing, as well as market hotspots and areas of low demand. However, the guidance stops well short of recommending the use of some form of hedonic analysis. It also recommends using household migration and search patterns reflecting the "preferences and the trade-offs made when choosing houses with different characteristics" (MHCLG, 2015:4) and suggests identifying HMAs on the basis of migration self-containment of 'typically 70%', thus providing a number of somewhat vague theoretical links to the access-space and filtering models, as well as the theoretical work undertaken by Jones *et al*. (2010) and Jones *et al*. (2012).

Overall, therefore, this guidance provides planners with a broad indication of what is required to undertake housing market analysis on the basis of functionally defined HMAs, but the lack of more specific guidance and the absence of any attempt to produce one consistent geography only reinforces the potential for even greater 'contradictions and inconsistencies' than those highlighted by Ferrari *et al*. (2011) in relation to the SHMAs produced under the previous more detailed guidelines.

Indeed, more recent analysis based on detailed case studies of practice in three local authorities in South East England (Holly, 2017) would suggest that the situation has deteriorated. Holly (2017) argues that in the 2000s the process of planning for housing was a "broadly hierarchical and technically dominated policy arena" with household projections and other technical knowledge being used to ensure "developmental, market-enabling rationality at the local level" (p.2, 11). The

[10] The guidance defines a HMA as "geographical area defined by household demand and preferences for all types of housing, reflecting the key functional linkages between places where people live and work" (MHCLG, 2015:4).

technical dominance of the housing policy numbers game is seen as disguising the underlying political orientation and value judgements (Adams, 2011; Inch, 2012). Holly sees the Conservative reforms that abolished the regional planning tier and the new guidance to local authorities to 'meet objectively assessed needs' with a greater emphasis on economic growth and 'responsiveness to market signals' as a potential threat to established 'rationalities' and envisages a greater role for political debate.

Drawing on evidence from the examination in public of the plans of three selected local authorities, Holly (2017) provides an insight into the complexity and longevity of the debates in relation to the meaning of 'objectively assessed need', the assumptions underpinning household projections (including migration assumptions) and the restrictive nature of planning on the basis of projecting past trends and the meaning of sustainability. However, Holly concludes that while there were some key differences in terms of policy outcomes between the three council areas, in all three cases projected housing requirements were central to the inspectors' decisions. Despite the absence of a single authoritative projection from the higher regional tier (as under the previous regime) inspectors viewed central government household projections and the demographic projections derived locally on this basis as 'control' figures, with any deviation from these requiring careful justification. However, compared to the pre-2010 regime there is a greater emphasis on affordability, economic needs and environmental issues. Importantly too, there is clear evidence of inspectors emphasising the need for a "rationality of decision-making and evidence-based policy making" (Holly, 2017:693).

Holly (2017) argues that the new Government guidelines that transferred power for determining housing requirements to the local level led to 'intense local conflict' between a number of different 'policy rationalities', thus enabling political issues to be debated. The study demonstrated the resilience of past practices, in particular the technical rationality of the planning for housing process. Holly (2017:695) concludes by postulating that the case studies in South East England suggest a "wider resilience of established antipolitical governance practices and the policy rationalities they sustain", and notes that this is supported by subsequent policy responses (MHCLG, 2014; DCLG, 2017a).

The Government's White Paper *Fixing our Broken Housing Market* (DCLG, 2017a) was published in February 2017 against a background of the increasing unaffordability of housing for 'ordinary working class people'. The White Paper emphasised the need for more land for homes in locations where people want to live and the importance of building more quickly after the granting of planning permission, as evidenced by the growing gap between the number of dwellings for which planning permission had been granted and the numbers actually completed[11]. The existing system was criticised for enabling local authorities to "duck potentially difficult decisions, because they are free to come up with their own methodology for calculating 'objectively assessed need'" and committed Government to "develop and consult on a new standard method and encourage councils to plan on this basis" (DCLG, 2017a:14). Arguments about the number of homes to be built was regarded as a particular cause of delay, and the approach to identifying housing requirements was criticised for being particularly complex and lacking transparency. Attention was drawn to the NPPF, which fails to provide specific guidance on the process of identifying housing requirements, leading to lengthy debate at examination in public about the validity of particular methodologies. The White Paper concluded that a more standardised approach would provide greater transparency and consistency.

This already reflected to a certain extent the recommendations of the Local Plan Expert Group that had been established by Government to make recommendations that would improve the efficiency and effectiveness of local plan delivery (LPEG, 2016). The very detailed report of this expert group of practitioners highlighted the problems faced by local authorities in completing SHMAs, both because of the lack of pre-determined HMA boundaries and the lack of specific guidance on methodology – and characterised SHMAs as "burdensome, complex and controversial components of plan making" (ibid., para.S.11). The group was also highly critical of local authorities (two-thirds of whom had still not completed an SHMA four years on from NPPF requirement to do so) and highlighted cases where certain local authorities had been excluded from HMAs, despite their obvious shared geography, as well as local authority boundaries being used as inappropriate HMA

[11] By 2015/16 this gap had grown to 100,000.

boundaries. The group recommended the "adoption of a simplified, standard common methodology… for the preparation of concise SHMAs" (ibid., para.3.20). It also recommended updating the 2010 Study of HMA boundaries (Jones *et al*., 2010) to reflect most recent evidence (notably the 2011 census), identifying best fit HMAs in relation to local authority boundaries and guidance to reinforce the need to use HMA boundaries which meet the functionally-defined HMAs set out in the 2010 study.

In September 2017, the Department for Communities and Local Government published consultation proposals entitled *Planning for the right homes in the right places* (DCLG, 2017b). It reflected a number of the LPEG recommendations. In particular, it set out proposals for a standardised method for calculating housing need that addressed the complexity and lack of clarity associated with the existing methodology that "leaves substantial room for interpretation" (DCLG, 2017b:8). The proposed method was to be based on publicly available data and would provide an estimate of future housing requirements that combined need and what is affordable. It reaffirmed Government emphasis on a more market-orientated approach to assessing and meeting housing need based on the assumption that "affordability of new homes is the best evidence that supply is not keeping up with [effective] demand" (ibid:9).

The proposed new standardised approach was to involve three components:

1. The starting point would continue to be projections of household growth. However, these were to be the official ONS projections provided for each local authority, giving a demographic baseline equating to "annual average household growth over a 10 year period" (ibid:11).
2. Modification of the projected number of newly arising households to take account of market signals – which in practice was to be the local authority level median affordability ratios produced by ONS. "Each one per cent increase in the ratio of house prices to earnings above four results in a quarter of a per cent increase in need above projected household growth" (ibid:11).

3. A cap to limit the increase in the supply of housing. In order to ensure deliverability, the capping adjustment would take into account the status of a local authority's current local plan.

Local authorities were also allowed to increase the resultant housing need figure to take account of an expected substantial increase in economic growth. The proposals also recognised that many local authorities were working collaboratively, but, surprisingly given previous research findings, suggested that housing need for any such defined area "should be the sum of the local housing need for each local planning authority" (ibid:14). However, this appears to be contradicted to a certain extent by a later section of the proposals which reinforced the need for cross-boundary collaboration in strategic planning matters enshrined in the Localism Act 2011, and bemoaned the fact that in many cases local authorities were failing to meet their duty to co-operate, resulting in the non-adoption of local plans. This lack of co-operation was to be addressed through a 'statement of common ground' over the housing market area or other agreed geographical area. The proposals recognised that the new 3-stage approach "shifts the focus away from housing market areas" but considered them in most cases to be the most appropriate areas for statements of common ground. The revised NPPF, however, would suggest that local planning authorities should use agreed housing market areas as the "geographical area for developing statements of common ground" (ibid.:23) unless they can justify an alternative spatial framework.

This proposed new methodology certainly offers a much simpler (if somewhat confused) approach, and may potentially address the issues of lack of transparency and the delays to local authority plan approvals and planning permissions that have led to major criticism of the planning process in England. However, despite the stated commitment to encouraging local authorities to work together, the proposed methodology appears to encourage analysis based on local authority geographies, thereby reversing much of the previous good practice, which recommended data analysis based on more meaningful functionally-determined boundaries.

The consultation undertaken by Government on these proposals revealed a broad level of support for this new methodology (MHCLG, 2018). It was included in the

revised *National Planning Framework* published in 2018 (updated in February 2019, MHCLG, 2019a) and the associated *Planning Practice Guidance on Housing and Economic Needs Assessment* (MHCLG, 2019b).

3.3.3 Housing Need and Demand Assessment in Scotland

In Scotland, policy and practice in relation to the spatial framework for assessing future housing requirements followed a more consistent path than in England, despite a major overhaul of the planning system heralded by the Planning (Scotland) Act 2006. Section 3.4.1 made passing reference to the fact that Scotland had made the transition to housing market analysis (Local Housing Systems Analysis) in the 1990s and was reflected in a very comprehensive guidance published by Communities Scotland that set out clearly both the theoretical background to housing market areas and gave practical guidance on how to define them (O'Sullivan *et al*., 2004).

In addition, in 2002, Communities Scotland commissioned DTZ Pieda Consulting to undertake a study that would provide a deeper conceptual understanding of HMAs and their definition in Scotland. The final report contained a good practice procedure for defining HMAs using house sales/purchase data held by the Register of Sasines/Land Registry to analyse household movement patterns. The report recognised that this focussed on migration in the owner-occupied sector but accepted this on the basis that owner occupancy was the dominant tenure. The report was also critical of the LHSA methodology for although it accepted the principle of self-containment it rejected the initial stage of the HMA delineation process used in the LHSA approach. LHSA methodology started with what, DTZ Pieda contends, were, in functional terms, somewhat arbitrarily selected areas (often local authority boundaries) and then adjusted these boundaries in the light of empirical evidence based on the analysis of household movements. In contrast, DTZ Pieda used the concept of urban hierarchy and worked from the largest urban centres down the hierarchy, justifying this approach by noting that housing market areas are closely related to labour markets and that "the spatial organisation of the national economy is 'anchored' on the major urban settlements (Communities Scotland, 2003:3). The analysis was based not on self-containment but, as with TTWAs, on

housing related movements between the city and the surrounding areas. However, the study correctly concluded that there is no single 'correct' procedure for defining HMAs in practice and that all of them implied a simplification of a complex reality, the use of arbitrary cut-off points (on self-containment) and relied on imperfect (including out of date) data. The study concluded that this methodology offered "an appropriate starting point for a 'good practice' approach to market area definition" (ibid.:3).

The Scottish Government's Planning Division and Communities Scotland responded by recommending the adoption of this method as non-statutory guidance that represented best practice. This was reflected in *Scottish Planning Policy (SPP3): Planning for Homes* (Scottish Government, 2008a), which dealt with the identification of housing requirements and the provision of land for housing through the planning system. SPP3 set out how local authorities should address the provision of new housing in their development plans. The number of new dwellings was to be "informed by an assessment of housing need and demand. This should be undertaken on a functional housing market area level and will consider the operation of the housing system as a whole, covering all tenures (Scottish Executive, 2008a, section 7). SPP3 goes on to outline the stages of the process from the identification of housing requirements through to development plan preparation (Figure 3.2).

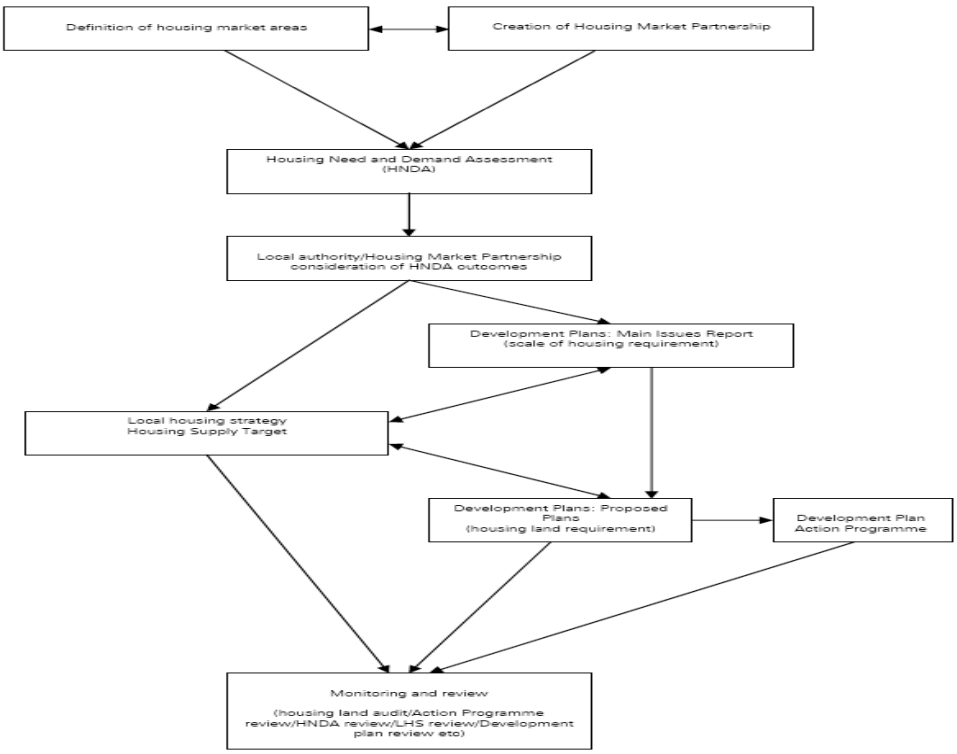


Figure 3-2: Identification of housing requirements

Source: Scottish Government (2008a, Section 19)

SPP3 defines a HMA as a geographical area where the demand for housing is relatively self-contained, "i.e. where a large percentage of the people moving house or settling within the area have sought a dwelling only within that area" (Scottish Government, 2008a, Section 20). SPP3 also makes specific reference to the definition contained in Communities Scotland's *Local Housing System Analysis Good Practice Guidance* (O'Sullivan *et al*., 2004:42) that defines a HMA as "geographical area where most people both live and work and where most people moving home (without changing job) will have sought a house". However, SPP3 is not prescriptive as to the specific methodology: "Local authorities should define the housing market areas to be used in determining housing requirements, following one of a range of approaches referenced in the HNDA guidance" (Scottish Government, 2008, Section 20).

In a linked but separate document, the Scottish Government published Housing Need and Demand Assessment (HNDA) Guidance to help ensure a more robust and consistent approach to the assessment of future housing requirements required for the development of the local housing strategies and development plans required

under SPP3 (Scottish Government, 2008a). Local authorities were encouraged to co-operate regionally by establishing Housing Market Partnerships, enabling adjoining authorities to work together where functional HMAs cross local authority boundaries. Once again, however, no specific methodology is recommended. The HNDA Guidance document highlights four practical ways to identify HMAs: pre-defined boundaries, origin- and destination-based self-containment, centre to periphery household flows and local knowledge, but "recognising that different approaches are required in different areas" does not recommend "one approach over another" (Scottish Government, 2008a:10).

In 2010, all SPPs, including therefore SPP3, were revoked and replaced by a single comprehensive Scottish Planning Policy. This new document, however, essentially reiterated previous guidance on HMAs in summary form, confirming that "local authorities should define the housing market areas that will be used in determining housing requirements by following one of the approaches set out in the Housing Need and Demand Assessment guidance" (Scottish Government, 2010b, para.68).

In 2014, the Scottish Government issued a revised comprehensive policy statement on how nationally important land use matters should be addressed. In relation to housing, the policy emphasises that new homes should be located where economic investment is planned and that a 5-year supply of 'effective land for housing' should be maintained. "Local authorities should identify functional housing market areas, i.e. geographical areas where the demand for housing is relatively self-contained. These areas may significantly overlap and will rarely coincide with local authority boundaries" (Scottish Government, 2014b:para.111). The need for co-operation between housing and planning officials across local authority boundaries is stressed. Local housing strategies and development plans should be informed by a housing need and demand assessment (HNDA) addressing all tenures, undertaken at both the functional housing market area and at local authority level and prepared in line with the Scottish Government's HNDA Guidance. If Scottish Government is satisfied that this HNDA is 'robust and credible', the methodological approach will not need to be scrutinised at development plan examination.

A revised version of the HNDA manual was issued in 2014 (Scottish Government, 2014a) and unlike in the original 2008 version there is no detailed explanation of functional housing markets. However, there is a clear statement in this document, and in the more recent updated version, that HNDAs should be undertaken "at a geography that reflects the local Housing Market" (Scottish Government, 2018:4). Furthermore, unlike in England where recent policy documentation signals a Government preference to move away from the use of functional HMAs as the basis for housing market analysis, in Scotland the HNDA manual must be seen in the context of the Scottish Government's document on Planning Policy (Scottish Government, 2014a) and is a clear indication that analysis on the basis of functional HMAs is taken as read.

3.4 Northern Ireland – The Regional Development Strategy

Unlike in the rest of the UK, where planning for housing has essentially been the responsibility of local authorities, in Northern Ireland, this function was, until 2015, divided between four statutory organisations: the Department for Regional Development (responsible for the Regional Development Strategy), the Department of the Environment (with responsibility for Area Plans, Planning Policy Statements and development control), the Department for Social Development (with responsibilities in relation to the provision of affordable homes) and the Northern Ireland Housing Executive, a Non-Departmental Public Body, with responsibility for housing needs assessments and District Housing Plans. This created an additional complexity that was in some ways complicated further by the transfer of planning development powers to local authorities in 2015. Each of the 11 new "super" councils is legally obliged to produce a Local Development Plan and these are currently at various stages of the planning cycle.

The strategic planning framework for housing in Northern Ireland is provided by the Regional Development Strategy (RDS). The RDS comprised a vision statement, a Spatial Development Strategy and a series of Strategic Planning Guidelines. One of its key aims was "to facilitate the supply of additional housing to meet the projected needs of the Region over the next 25 years" (DRDNI, 2001:109). It recognised the close relationship between the location of housing and centres of employment that

"exerts a major influence on where people choose to live" (ibid:109), indicating an awareness of the interconnection between housing and the journey to work that underpins the access-space model.

Based on the Government Actuary Department's population projections[12] and a number of key assumptions, the RDS estimated the overall requirement for new housing in Northern Ireland between 1998 and 2015 to be 160,000 dwellings. The Strategy also included a number of guidelines (SPG-HOU 1 – 5) that provided an insight into the rationale for the subdivision of this overall figure of 160,000 into the Housing Growth Indicators (HGIs) for district council areas. The guidelines stressed the need for a "robust and flexible approach to meeting future housing need", (DRDNI, 2001:113) with projections being reviewed every five years and emphasised the importance of "more sustainable patterns of residential development" (ibid.:114) by integrating housing with centres of employment, and building at higher densities in existing urban areas.

The most significant guideline is SPG-HOU 3: "To set housing growth indicators to guide the distribution of housing in the Region over the period to 2015, through the development plan process, in accordance with the Spatial Development Strategy" (ibid.:116). A balance of growth was to be achieved by allocating 77,500 (48%) of the overall HGI total to the Belfast Metropolitan Area (BMA) and its hinterland with the remaining 82,500 (52%) to the North, South and West of Northern Ireland. "The critical balance identified in the Spatial Development Strategy is based on maintaining a strong economic heart in the BMA and its hinterland, and encouraging decentralised growth in the rest of the Region, with a focus on the North West and the main towns located on the key and link transport corridors" (ibid.:116). The HGIs for the district council areas outside the BMA are to be viewed as an "indicative allocation" reflecting the Spatial Development Strategy, the inherited settlement pattern, trends in population growth and the economic and cultural role of each district.

[12] Northern Ireland's population was forecast to grow from 1,689,000 in 1998 to 1,794,000 by 2015 (6%) (DRDNI, 2001).

The broad assumptions in relation to projected new household formation, vacancy rates, second homes and replacement of stock loss underpinning the HGIs were set out in an appendix to the Regional Development Strategy, but there was no actual methodological statement on their application either at the Northern Ireland or local level. Indeed, overall, there was a lack of transparency regarding the calculation of the HGIs and the public examination of the draft Regional Strategic Framework (the consultative forerunner of the RDS) held in 1999 was regarded as "a form of organised lobbying" (Paris, 2000:267). Discussions were dominated by developers on the one hand and residents' groups on the other "both articulating technical arguments which tended to downplay the interests that different advocates were representing" (ibid.:268). However, there was no discussion about the appropriateness of administrative boundaries as the optimum spatial framework for analysis.

By 2003, the inadequacy of the analysis on which the 2001 HGIs were based had become apparent. The overall requirement for housing had been calculated for a 17-year period (1998-2015), but by 2003 almost one half of the overall target of 160,000 had already been built, and in some district council areas almost two-thirds (NIHE, 2005a). In response to this and a commitment to review the HGIs on a five yearly basis (DRDNI, 2005a:5), the DRDNI issued a consultation document (DRDNI, 2005a) with revised HGIs based on new household projections[13] and updated stock estimates based on the 2001 House Condition Survey (NIHE, 2007). The document contained a revised regional HGI figure of 200,000 (1998-2015) – 25 per cent more than the original total. The rationale for the disaggregation of the total to district council level remained essentially the same – specifically the need to maintain "a strong economic heart in the wider city region around the BMA and encouraging a measure of decentralised growth in the rest of the Region" (DRDNI, 2005a:15). The original figures were adjusted by means of "a pro-rata uplift in each district council

[13] The Northern Ireland Statistics and Research Agency (NISRA) developed a new model for household projections using a two-point exponential model used by the Scottish Executive (Barry *et al*, 2005:12).

area" (ibid.:15) informed by a number of factors, including house building rates and urban capacity studies.

This document undoubtedly marked a significant step forward in terms of methodological transparency. Appendices to the document contained details of the assumptions underpinning the methodology as well as the actual figures used to calculate the overall HGI. There was also an indication that the spatial framework for analysis may not be ideal: "it should be noted that local government district figures are much more tenuous than those produced at Northern Ireland level" (ibid.:27). However, there is no evidence to suggest there was any consideration given to using a more appropriate spatial framework for the analysis.

The revised figures contained in the consultation document were reviewed at a Public Examination. An independent panel was appointed and tasked with scrutinising the soundness of the methodology used to produce the overall HGI figure for Northern Ireland as well as its disaggregation to district council level (DRDNI, 2006a:2). The report of the panel (DRDNI, 2006a) broadly endorsed the methodology for estimating future housing requirements at the Northern Ireland level[14], but shared the criticism of a number of participants in the Public Examination that the pro rata adjustment of the additional 40,000 dwellings merely reinforced the already flawed method of disaggregation. The panel highlighted a "lack of policy alignment between economic development and the allocation of HGIs, the absence of a proper sub-regional housing market analysis and the difficulty of proper spatial planning in the absence of information about labour and housing markets" (ibid.:26). It suggested that district council areas should be aggregated for the purposes of HGI calculations, noting that this would provide a more robust spatial framework for the analysis, but stopped short of specifically recommending the adoption of functionally defined HMAs.

The DRDNI accepted most of the panel's recommendations, including the upward revision of the Northern Ireland figure to 208,000 (DRDNI, 2006b). However, in

[14] It recommended increasing the projected housing growth figure a further 8,000, to allow for the major increase in the number of migrant workers who had arrived in Northern Ireland over the previous two years.

relation to the spatial framework for analysis, it merely stated that HGIs produced on the basis of the administrative boundaries were "necessary in order to achieve completion of the present Area Development Plan programme". It also gave a commitment to "give consideration to the sub-regional approach in consultation with DOE Planning Service" (ibid.:7) – a response that could be considered somewhat vague in light of what the Panel report actually states (DRDNI, 2006a, section 5.25) as well as ongoing developments in England and Scotland.

3.5 Planning for Housing in Northern Ireland – Transition to Housing Market Analysis

3.5.1 Bringing about the transition

The previous section highlighted the division of responsibility with regard to planning for housing in Northern Ireland and focused on the overarching role played by the Regional Development Strategy. This section examines the role played by the Northern Ireland Housing Executive's Corporate Planning department – one that was traditionally dominated by fulfilling its statutory role of housing needs assessment and the production of District Housing Plans as the basis for an annual consultation with district councils. Since the early 2000s this role has evolved more and more to encompass a much broader analysis of the housing market as a whole, and more recently to include the production of Housing Investment Plans that are designed to constitute an integral part of the Community Planning process, a transition that in many respects mirrored the developments in Scotland and England that culminated in housing market analysis (LHSA in Scotland) and SHMAs becoming an integral part of the local planning system in these two jurisdictions.

The Housing Executive's methodology for assessing housing need (which until the early 2000s meant essentially the need for social housing) was developed and refined over a period of three decades and relied almost exclusively on a comprehensive analysis of the waiting list for social housing, a waiting list that was based on a Housing Selection Scheme applied consistently across Northern Ireland. However, the Housing Executive's Corporate Planning Department was by no means unfamiliar with developments in GB and, as part of its ongoing programme of adopting good practice from elsewhere in the UK, it published a revised *Housing Need Assessment*

Guidance Manual (NIHE, 2005b) that closely followed the guidance published for England (DETR, 2000). However, additional features included the requirement to provide guidance to Department of the Environment planners on housing needs and housing market conditions as part of the local development plan process (NIHE, 2005a).

In 2006, the Housing Executive commissioned North Harbour Consulting to undertake research that would provide a comparative review of the housing needs assessment methodologies being used in England and Northern Ireland, including case studies of West Midlands and South-East England. However, it quickly became apparent that, given the institutional and methodological developments in England at that time (see section 3.3.2), this narrow focus would neglect developments with important implications for the Housing Executive. The scope of the research was therefore widened to encompass a much more extensive review of the planning for housing system in England, and in particular its evolution from housing needs assessment to a much broader housing market assessment.

The final report from this research (Palmer, 2007) emphasised the importance of understanding the differences between England and Northern Ireland in terms of their legal and governance structures, but also highlighted important similarities. The new regional assemblies established in England were tasked with preparing Regional Development Strategies, including Regional Spatial Strategies that indicated areas where investment was to be focused and provided the framework for land use planning at the local level. In parallel, Regional Housing Strategies that outlined the key requirements for housing of all tenures were to be prepared, including, for example, establishing locations where social housing should be concentrated. Each region was effectively given a housing target setting out the number of new homes to be built.

Developments in Northern Ireland closely resembled the regional policy framework being developed at that time in England in its essentials (Palmer, 2007). In particular, the RDS discussed in Section 3.4 was essentially a regional policy framework for which a new Northern Ireland Assembly had (and still has) ultimate responsibility, as an integral part of the Government's drive to achieve economic prosperity. As in

England, Northern Ireland's RDS constituted a unified framework of policies and strategies designed to promote economic development, transport infrastructure, housing and spatial planning. It contained a Spatial Development Strategy (Northern Ireland's equivalent of the England's Regional Spatial Strategies) based on "a hub, corridor and gateway framework" (DRDNI, 2001:42) to guide land use planning at local authority level and provided an indication of the number of new homes to be built by means of its Housing Growth Indicators. However, unlike in England, no Regional Housing Strategy was required.

Planning Policy Statement 12 (PPS12) *Planning for Housing in Settlements* (DRDNI, 2005b) emerged in the wake of the RDS and tasked the Housing Executive with responsibility for preparing "a Housing Need Assessment in relation to identified areas of the housing market" for each of the new Area Plans being drawn up by the Department of the Environment, a document that would be published as a "technical supplement in support of the development plan" (DRDNI, 2005b: para. 37/38). In its role as the regional housing authority for Northern Ireland, the Housing Executive was already responsible for a number of key elements in the planning for housing process – in particular its regular estimates of the overall requirement for social housing based on a Net Stock Model − which formed the starting point of the Social Housing Development Programme − and the preparation of District Housing Plans. These plans drew on a combination of sources (such as the waiting list for social housing, the Northern Ireland House Condition Survey and local intelligence from housing associations and estate agents), as the basis of analysis underpinning a 3-5 year programme combining the construction of new social housing and improvement/maintenance programmes for existing social housing with expenditure proposals for a range of home improvement grants for the private housing sector.

The Housing Executive's *Housing Need Assessment Guidance Manual* (NIHE, 2005b) provided detailed procedural guidance for its Corporate Planning department, in response to the new framework created by the RDS and PPS12. It required the preparation of a regional housing context that summarised how "socio-economic, political, demographic and housing supply / demand issues are operating", stating that DoE Planning Service would provide the draft narrative of this contextual

statement "for inclusion in the HNA" (DRDNI, 2005b:58). In practice the Housing Executive took on this role, providing what was broadly speaking a synthesis of the Housing Executive's own annual *Northern Ireland Housing Market: Review and Perspectives* document and the RDS (Palmer, 2007). This summary document effectively provided the contextual background for a more detailed district level analysis that focused on nine housing categories set out in PPS12[15]. However, there was an inherent methodological weakness in this approach. Both the DCLG (2007a, 2007b) guidance and the case studies carried out in West Midlands and South-East England indicated that housing needs assessment should form one component of a wider housing market assessment process rather than this wider assessment being 'included' into the housing needs assessment process (Palmer, 2007).

Nevertheless, despite differences in institutional and procedural arrangements between England and Northern Ireland, the "family of economic, spatial and housing planning documents" being produced by the two systems can be characterised as "substantially similar" (Palmer, 2007:28). In Northern Ireland, however, there was at this stage no real analysis of the housing market as a whole, either at a regional level or locally. The regional housing context included considerable detail about all sectors of the housing market and when aggregated portrayed important aspects of housing need, but not the dynamics of housing market as a whole, something that was critical to the approach to regional planning being developed in England at that time − an approach that recognised that housing markets operate across tenures and are not co-terminus with local authority boundaries.

Palmer (2007) concluded that, overall, there appeared to be a lack of co-ordination between Government agencies in Northern Ireland with regard to analysis of the housing market. In addition, in comparison to England, two critical stages of the planning for housing process were being omitted: firstly, a regional housing strategy and secondly, a holistic analysis and interpretation of the dynamics of housing markets (including the interaction of their component sectors) that would not only

[15] Regeneration programmes and estate strategies; social housing; affordable privately rented housing; affordable owner-occupied housing; empty homes; student accommodation; supported housing; travellers accommodation; and second homes (DRDNI, 2005b).

support the RDS, but also provide the context for planning for housing at sub-regional and local levels.

The report recommended that the Housing Executive should adopt the principles and methodology set out in DCLG (2007a, 2007b) guidance. Housing needs assessment would still be required, but should be incorporated into a process of housing market analysis that would create a framework for planners to interpret local housing conditions and imbalances and then assess the types and levels of unmet housing need that may arise in consequence of the interaction between the housing market and the wider economy.

3.5.2 Defining Northern Ireland's Housing Market Areas

It was in response to this that the Housing Executive commissioned a team led by Glasgow University with considerable expertise in LHSA to undertake a study into the geography of Northern Ireland's housing market areas "to provide a suitable spatial framework for subsequent housing analysis and strategy development " (Young *et al*., 2010). The study emphasised the importance of analysis based on functional geographies that informed households' housing market choices rather than one based on administrative boundaries that could, for example, result in a sub-optimal programme for releasing land to meet housing need/demand.

The study adopted the Scottish definition of a housing market area ("a geographical area where most people both live and work and where most people moving home (without changing jobs) will have sought a house" (O'Sullivan *et al*., 2004; cited in Young *et al*., 2010:9). It recognised the practical complexities of this approach in which boundaries shift over time, may overlap, are not coterminous with local authority boundaries and usually incorporate a number of recognisable submarkets.

The actual methodology used was inevitably influenced by data availability. It drew heavily on data from the 2001 Census, including travel-to-work-areas (TTWAs) and household migration data, as well as the Central Health Index (CHI), which provides information on an ongoing basis of re-registrations with a general practitioner (GP) that can be used as the basis for estimating internal migration. A specially

commissioned household survey as part of the Northern Ireland Omnibus Survey provided additional information.

The study adopted a four-stage approach:

Firstly, it examined the 2001 Census based TTWAs in the light of household migration patterns between TTWAs and local government districts (LGDs) and selected centres of employment. Datasets for TTWAs, LGDs and employment centres were constructed using ward-based Special Migration Statistic (SMS) outputs from the 2001 Census.

Secondly, and consistent with TTWA methodology, a 67% threshold for residential moves occurring within a TTWA (origin-based self-containment[16]). This was followed by the application again of a 67% threshold to the number of migrant households, who, following their move remained within the TTWA rather than moving to another (destination-based self-containment[17]). Analysis of the 2001 Census-based household migration patterns confirmed that TTWAs provided a useful initial approximation of housing market areas (HMAs) in Northern Ireland although some adjustments were required and in some cases there were significant overlaps.

Thirdly, the study team examined migration flows using CHI data, focussing on flows between local areas (wards) and the wider TTWA in which a ward or cluster of wards was located. This analysis was supplemented by analysing flows from employment centres to surrounding settlements. A 10% threshold was generally adopted to indicate significance of attachment for inclusion of a local area into an adjacent HMA. However, in the case of Belfast TTWA and employment centre a higher threshold was applied to reflect the much greater size of the Belfast Metropolitan Area and the distinctiveness of its housing market. The findings from the analysis of CHI data from 2004-2007 were used to either confirm the HMA boundaries identified using 2001 Census data or identify significant changes locally that may have taken place over time.

[16] Origin-based self-containment = number of migrant households moving within each TTWA divided by the total number that moved within/into that TTWA from anywhere in Northern Ireland.
[17] Destination-based self-containment = number of migrant households moving within a particular TTWA divided by the total number that moved to somewhere in Northern Ireland.

Finally, additional more qualitative insights were gained from examining data from the Republic of Ireland's Census (with the purpose of exploring cross-border movement) and from results of the Omnibus Survey, as well as discussions with key stakeholders involved in the planning for housing process in Northern Ireland to assess the validity of the proposed HMA boundaries.

A series of maps in the concluding section of the report illustrate the final outcome of this complex study. Northern Ireland was deemed to have 11 housing markets. In western areas of Northern Ireland there is a significant coterminosity between HMA boundaries and TTWA and LGD boundaries. However, in the east considerable divergence was identified, particularly in relation to the boundaries of the Belfast HMA, which incorporates 10 entire LGDs (as well as parts of a number of adjacent ones) and extends considerably further than the Belfast TTWA, reflecting the dynamics of the Belfast housing market in the 2000s where rapidly rising house prices up to 2007 forced many households with employment and/or roots in Belfast to seek affordable solutions to their housing requirements at considerable distances from the city – particularly along the main arterial routes into Belfast (NIHE, 2008).

In their conclusion, the authors of the report correctly highlight the resources required to undertake this complex study that reflected both good practice in GB and the methodological options provided by the data available in Northern Ireland. In the end the absence of Land Registry data meant that in Northern Ireland the approach adopted was essentially a hybrid of the Scottish and English methodologies. The report also noted that given the fluid nature of HMA boundaries (particularly in and around the Belfast HMA) the Housing Executive should repeat the exercise following availability of data from the 2011 Census.

3.5.3 Defining Submarkets in the Belfast Metropolitan HMA

Over the next three years this definition and delineation of Northern Ireland's 11 HMAs was followed by a housing market analysis for each of the 11 areas identified. The first of these was undertaken as an exemplar for the Belfast Metropolitan Housing Market Area (O'Sullivan *et al*., 2011) by the same core team that had undertaken the original HMA boundary study. It re-emphasised the importance of

using functional boundaries that reflect the housing and location choices of households rather than administrative boundaries and the importance of understanding the inter-connections between wider economic, social and political forces and the supply and consumption of housing in order to inform policy that that seeks both to influence the volume and mix of private sector and social/affordable homes and make more effective use of existing stock.

A key element of the Belfast Metropolitan HMA study (O'Sullivan *et al*., 2011) was its delineation of submarkets that are nested within the Belfast HMA. Drawing on the definitional work of Watkins (2001) in relation to Glasgow (section 2.5.3)[18], the study used more detailed examination of the migration flows emerging from the analysis of the CHI data (2004-2007) used in the original report to determine the "degree of connectivity between different urban areas, settlements and rural localities within the Belfast Metropolitan HMA" (O'Sullivan *et al*., 2011:17). Wards were adopted as the 'basic building block' given that this was the lowest level of disaggregation for which robust, consistent data was available.

The study selected the two adjacent LGDs of Belfast and Castlereagh as the heart of the Greater Belfast submarket in recognition of their long-established connectivity[19], a relationship that was borne out by the high proportion of migrant households who moved within or to Castlereagh actually originating from Belfast (30%). In order to delineate the boundaries of the Greater Belfast submarket the process gauged the degree of influence of the combined Belfast/Castlereagh LGDs over wards in the remainder of the Belfast Metropolitan HMA, and in particular the proportion of migrant households that moved to these wards from Belfast or Castlereagh. If this proportion was at least 20 per cent the ward was considered to be subject to 'major influence' from Belfast/Castlereagh. In addition, if this proportion was only 15-19 per cent, but in-migration from any other adjacent LGD was less than 5 per cent, it was

[18] Citing Watkins (2001), the study highlights the absence of an agreed definition of a 'housing submarket', but notes that economists tend to use the term for a "sub-set of dwellings that demonstrate a different house price structure and rate of house price inflation from the surrounding housing market over a long period of time" (O'Sullivan, 2011:15).

[19] Large densely populated areas of Castlereagh LGD (e.g. Cregagh and Braniel) would have traditionally been regarded as part of Belfast City and were included within the boundaries of the old Belfast Corporation.

considered to have been subject to 'major influence' from the urban core of Belfast/Castlereagh. In the case of wards where these tests proved inconclusive additional analysis focussed on migrant households aged 25-44 to ensure that the analysis reflected migration patterns of households most likely to have moved for housing related reasons (O'Sullivan *et al*., 2011).

Having delineated the boundaries of the Greater Belfast submarket, a similar three-step process was used to define the remaining submarkets in the Belfast Metropolitan HMA on the basis of influence and connectivity. However, as in the case of the methodology used to delineate Northern Ireland's HMA boundaries (Young *et al*., 2010), a lower threshold (10% instead of 20%) was applied (compared to the 20 per cent used for the Greater Belfast HMA). If the percentage of all in-migrants to a specific ward exceeded this 10 per cent threshold, it was considered to be subject to 'major influence' from the originating LGD or settlement.

Based on this analysis the study proposed 7 submarket areas for the Belfast Metropolitan HMA. In a small number of cases the methodological approach (analysis of origin-destination flows) did not produce a conclusive result – usually in the case of wards with very high degrees of self-containment (more than 85%). and these were agreed through a series of discussions with expert stakeholders to ensure coterminosity and corresponded with the views of housing professionals such as estate agents with experience of the dynamics of Belfast's housing market.

Much of the detail of this exemplar housing market analysis study mirrors the work carried out in Scotland (LHSAs) and England (SHMAs). There is an emphasis on understanding inter-tenure flows (particularly between the social sector and the private rented sector) in the context of the rapid growth of the private rented sector in Belfast. The assessment of housing need is embedded within the overall Belfast Metropolitan HMA study as recommended by good practice in GB. The study also highlights the somewhat speculative nature of the predicted future trends given the complexity of the housing system and the difficulty of estimating the impact of the wider economic and socio-political environment. However, it emphasises that "the economy and the housing market are highly cyclical and intertwined" (O'Sullivan *et al*., 2011:141) and recognises that this is the context for the significant imbalances in

the housing system – the identification of which is a key task for housing market analysis. In the case of the Belfast metropolitan housing market the most significant imbalance was identified as affordability: the increasing difficulties experienced by first-time buyers attempting to access the owner-occupied sector.

The study concluded by summarising the short-term prospects and the longer term challenges facing the housing system and with regard to overall future housing requirements suggested that "the changed economic circumstances and tightening of public expenditure indicate that the assumptions on which long-range household projections and thus the RDS housing growth indicators are founded will require careful monitoring" (O'Sullivan *et al*., 2011:145).

3.6 Recent Developments in Northern Ireland: Updating the Housing Growth Indicators and HMA Boundaries

The original Regional Development Strategy (DRDNI, 2001) had envisaged a requirement for 160,000 additional dwellings during the period 1998-2015 but had emphasised the importance of updating the Housing Growth Indicators. However, newly published demographic data and housing statistics emerging from the 2001 Census and the 2001 House Condition Survey respectively led to a significant upward revision of this figure to 200,000. Following a Public Examination in February 2006, the overall Northern Ireland total was increased by 8,000 to 208,000 to reflect the growing number of migrant workers that came to Northern Ireland in the mid-2000s.

In June 2008, in response to ongoing criticism from developers in particular, who saw the HGIs as unnecessarily restrictive in terms of forward planning, a fundamental review of the RDS was launched. The ultimate outcome of this review was a new strategy: *Regional Development Strategy – RDS 2035 – Building a Better Future* (DRDNI, 2012). As with the original RDS, the stated purpose of RDS 2035 was to provide an "overarching strategic planning framework to facilitate and guide the public and private sectors" (DRDNI, 2012:12). Planners were tasked with identifying housing land in development plans that would take into account need identified in the Housing Needs Assessments/Housing Market Analyses undertaken by the Housing Executive. The overall requirement for new homes 2008-25 was estimated to be 190,000, giving an average annual figure of around 11,200 (somewhat lower

than the figure of approximately 12,200 in the previous RDS). However, the HGIs in the RDS 2035 document were based on 2008-based household projections that had overestimated the rate of household formation. In 2011 there were in fact 12,000 fewer households than had been forecast using the 2008-based projections.

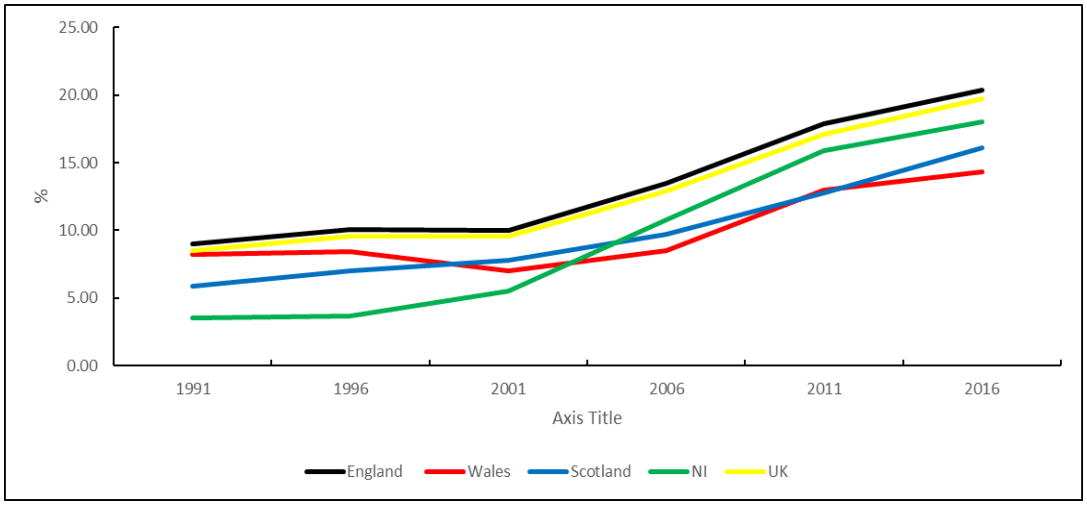
Following the publication of new 2012-based household projections (NISRA, 2015) that took into account future estimates of household formation that reflected the more challenging economic context and tighter public expenditure environment following the Global Financial Crisis (DfCNI, 2018), new HGIs were published (DfINI, 2016). These new projections used essentially the same methodology as the previous ones, adjusted to take on board some changes in terms of data availability. The projected requirement for new dwellings 2012-25 was estimated to be 94,000 (an annual rate of some 7,200, representing a significant reduction from the previous 2008-based projections, reflecting "the substantial reduction in the rate of household formation that took place following the sharp economic downturn that was associated with the bursting of the housing market bubble in 2007/08" (DfCNI, 2018:33). What is most significant, however, is that despite the Panel's recommendations that were published following the Public Examination of the HGIs in 2006, and more importantly the HMA framework developed by the Housing Executive, the basis for the new sub-regional HGIs continued to be administrative boundaries. The new HGIs were calculated merely using data available for the 11 new local government districts (LGDs) and "constrained to add to the Northern Ireland total of 94,000" (DfINI, 2016:7). The methodological statement provides no indication of why there was no consideration given to changing the geographical framework to reflect what was clearly considered to be good practice in GB. Similarly, the most recent revision to the Housing Growth Indicators based on household projections for 2016 made no alteration to the basic methodology, including the spatial framework for analysis which remains the 11 LGDs (DfINI, 2019).

A review of Northern Ireland's functionally based HMAs undertaken on behalf of the Housing Executive (Newhaven Research, 2018) and applying essentially the same methodology (on the basis of updated data), revealed that there had only been minor changes to the HMA boundaries compared to the original study (Young *et al.*, 2010).

The most important of these was in relation to the Belfast Metropolitan HMA, the boundaries of which no longer extend as far into Belfast's surrounding hinterland. Although the study did not attempt to throw light on the reasons for this, it may well reflect the fact that house prices in Belfast have remained significantly lower than they were prior to the sharp post-GFC housing market downturn (NIHE, 2015), when many first-time buyers had been forced to seek homes at more affordable prices located at greater distances long the main arterial routes from Belfast city (NIHE, 2007).

3.7 The Growth of the Private Rented Sector in Northern Ireland and the Role of Government Policy

A significant increase in the private rented sector in both absolute and, more importantly, in proportional terms has been a key characteristic of the housing markets of advanced economies since the beginning of the new millennium (Crooke and Kemp, 2014). The trend has been particularly striking in Anglophone countries such as Australia, New Zealand, the USA, Ireland and the UK (Pawson *et al*., 2017). Figure 3.3 shows that all four countries of the UK, including Northern Ireland, experienced this same trend.



Source: Stephens *et al*., 2018

Figure 3.3: Privately rented dwellings as a proportion of dwelling stock in England, Wales, Scotland, Northern Ireland and the UK, 1991-2016

The underlying causes of this growth in private renting and their relative importance have been analysed and debated in a burgeoning academic literature on the private

rented sector. Factors identified as common in the context of all advanced economies include the changing structure of labour markets (greater insecurity of employment and incomes in particular); longer term changes in the pattern of household formation (for example, increasing numbers of single person households, later age of marriage and higher levels of relationship breakdown); a growing affordability issue for first-time buyers (reflecting the widening disparity between incomes and house prices); the deregulation of financial markets; the financialisation (commodification) of housing and the associated boom in speculative investment in market rental housing; and, internationally, Government policy being increasingly underpinned by a neoliberal outlook that favoured market solutions to housing issues and in turn found its expression in significant reductions in central and local government funding for the construction of new social dwellings (Gibb, 2003; Hulse and Pawson, 2010; Maclennan and O'Sullivan, 2011; Murie, 2012; Crook and Kemp, 2014; Stephens *et al*., 2018; Pawson *et al.*, 2017).

The UK housing market in particular experienced a major structural transformation. Paris (1995:1630) contrasted the situation in the USA, Canada and Australia, where, because of a favourable tax regime, investment in the private rented sector remained viable, to the UK where "taxation and other public policies have resulted in its almost terminal decline". However, predictions of the demise of the private rented sector in the UK were premature. Crook and Kemp (1996) had identified that the sector was already showing signs of revival between 1988 and 1993. During this period rising unemployment and significant increases in interest rates, mortgage arrears and repossessions meant that owner occupiers who had to move were sometimes unable to sell their property. Instead they chose to let it out and rented in another location, while first-time buyers delayed house purchase, preferring to remain for lengthier periods in the private rented sector (Kemp, 2004).

Between 1996 and 2000, however, the actual number of dwellings in the private rented sector remained fairly stable (Stephens *et al*., 2018), but the new millennium ushered in a period of rapid growth. Between 2000 and 2012 the number of privately rented dwellings more than doubled (from 2,387,000 to 4,920,000) (Murie and Williams, 2015).

As in other advanced economies, in the UK too, a key underlying factor in this rapid growth was the deregulation of the financial markets from the mid-1980s onwards. This enabled banks and building societies to develop new lending products and in particular the increasingly available Buy-To-Let (BTL) mortgages at rates that were closer to the lower interest rates paid by owner occupiers[20] (Kemp, 2004; Gibb and Nygaard, 2005; Crook and Kemp, 2014, Marsh and Gibb, 2019). In addition, from the mid-1990s onwards interest rates generally were reduced to historically low levels, helping to ensure that borrowing to invest in the private rented sector became a much more viable proposition (Kemp, 2004).

Sprigings (2008) observed that by 2006 Buy-To-Let (BTL) mortgages accounted for almost one-third of the UK total and suggested that an important driver of this trend was investor decisions determined by the rate of short-term capital return on housing relative to other forms of assets. Following the Global Financial Crisis and the subsequent 'credit crunch' the number of BTL loans in the UK contracted drastically (from 346,000 in 2007 to 88,400 in 2009), but subsequently increased again and by 2013 BTL loans were accounting for an increasing market share – nearly 14 per cent of total UK gross mortgage lending (Murie and Williams, 2015). Sprigings (2008) highlights a link between these financial drivers and the significant increase in the number of apartments being built, a dwelling type that became a preferred choice for many investors in the private rented sector.

Lower interest rates and a weaker stock market during the 2000s also played a key role in stimulating investor interest in the private rented sector. Lower interest rates reduced the attractiveness of bank and building society deposit accounts as well as the size of payments from pension annuities (Kemp, 2004). A weaker stock market meant poorer returns for individual investors and pension funds – an issue compounded by the increasing number of companies that replaced their defined

[20] Buy to Let (BTL) was originally introduced by the Association of Residential Landlord Agents (ARLA) in association with a panel comprising a number of mortgage lenders in 1996. Previously, the mortgage lending criteria and products available to private landlords were expensive and inflexible, with landlords typically being charged two per cent more for their mortgages than owner occupiers. Under the new approved BTL scheme mortgage rates reduced to rates similar to those granted by owner occupiers, subject to agreement that the property would be professionally managed by a member of ARLA (Kemp, 2004).

benefit pension schemes with defined contribution ones. The net outcome of these developments was “to increase the attractions of rental housing as an investment and especially as a form of pension saving” (Crook and Kemp, 2014:191).

Government policy undoubtedly played a key role in the rapid growth of the private rented sector. Murie and Williams (2015) highlight a number of relevant policy strands: deregulation of the private rented sector that began in the 1980s and led to regulated and controlled tenancies being increasingly replaced by assured tenancies that were associated with less security of tenure and market rents; the introduction of Housing Benefit in the early 1980s that for many years provided significant levels of support to private tenants on low incomes and therefore indirectly subsidised landlords too (the overall Housing Benefit bill for the private rented sector rose from £3.4 billion in 1997/98 to £9.3 billion in 2011/12); and, finally, a generous tax relief on rental income available to private landlords that by 2010/11 amounted to £13 billion.

A number of other developments, a number of which were also directly as a result of Government policy also help explain the growth of private renting in the UK: the number of social dwellings sold to sitting tenants that over a period of three decades ended up in the private rented sector (in many areas 30 per cent or more of these properties); changes to homelessness legislation enabled local authorities to fulfil their responsibility to rehouse homeless households in the private rented sector; the growth in student numbers; the sharp rise in the number of economic migrants, particularly from eastern Europe; increasing overseas investment in the UK housing market, and especially in London; and, following the GFC, the emergence of residential property as a ‘preferred asset class’ for both corporations and individual investors (Murie and Williams, 2015; Crook and Kemp, 2014, Marsh and Gibb, 1919).

The rapid growth of the private rented sector in the first decade of the new millennium in Northern Ireland was rooted in basically the same UK-wide financial and policy environment. However, there are also a number of specific circumstances that in combination help to provide a more nuanced explanation.

Any analysis of developments in Northern Ireland's housing market in the 1990s and 2000s is complicated by political developments. It is very difficult to estimate the relative importance of the 'Peace Process' vis-à-vis wider economic factors such as rising incomes and increases in Government spending in causing the unsustainable housing market boom (and the inevitable bust) and the associated rapid growth in private renting (Gibb *et al*., 2007; Paris, 2008, Gibb *et al*., 2012). What is clear, however, is that political and economic factors combined in a way that meant Northern Ireland at one stage experienced the fastest rate of house price growth of any region of the UK (36% year-on-year between 2006 and 2007), and culminated in Northern Ireland having one of the highest average regional house prices for the whole of the UK[21] (Wilcox, 2008).

Gibb *et al*., (2012) regard underlying economic and demographic factors as the key drivers of Northern Ireland's housing market, with strong regional economic growth "supported by generous public spending, an economic boom in the Republic of Ireland, and EU funding support in the context of the unfolding peace process" (p.421). More specifically, Brown *et al*. (2007) drew out three key factors that combined to bring about a rapid change in the tenure structure of Northern Ireland's housing market: firstly, the meteoric rise in house prices that made it more and more difficult for first time buyers to access the first rung of the housing ladder; secondly, the low rate of construction of new homes in the social sector combined with the ongoing sale of a significant number of existing social dwellings each year up until the mid-2000s[22] that meant that the supply of homes for applicants for social housing was reduced; and, thirdly, the availability of increasingly substantial amounts of equity in the homes of existing owner-occupiers combined with the expectation of future house price increases that provided existing landlords and new investors with not only the opportunity of a rental stream "but more importantly good capital appreciation over a short time period" (Brown *et al*., 2007:8).

[21] In 2007, the average house price for the UK as a whole was £223,405. Only three regions of the UK had a higher average house price than Northern Ireland: Greater London, the South West and the South East (Wilcox, 2008:143, Table 47a).

[22] Following the review of the House Sales Scheme in 2004, which capped the level of discount at £24,000, the annual number of house sales dropped sharply (NIHE, 2012).

As in the rest of the UK, a number of other more specific factors contributed to the rapid growth in demand and/or supply of privately rented homes in the context of Northern Ireland, and again Government policy played an important role in driving this growth. Paris *et al*. (2003) recognised that the revival of the private rented sector during the late 1990s and early years of the new millennium could be attributed partly to a combination of the availability of Housing Benefit at UK-wide rates and relatively low house prices that provided 'attractive' rates of return. Gray *et al*., (2002) had drawn attention to the fact that many of the former Housing Executive homes that had been sold to sitting tenants had subsequently ended up being let privately[23], usually to tenants in receipt of Housing Benefit. It also became clear that demand for newly constructed dwellings in the private rented sector was stimulated by households on low incomes (who in previous decades would have been housed in social housing) wishing to access good quality affordable housing in more desirable areas without having to wait for extended periods of time on the waiting list for social housing. This demand-side factor was strengthened by the greater anonymity offered to mixed religion couples in private estates compared to the heavily segregated social housing estates in Northern Ireland (Gray and McAnulty, 2008; Gibb *et al*., 2012). The redevelopment of a considerable number of brownfield sites from the mid-1990s onwards, particularly in Belfast, included a significant number of apartments with city centre or water's edge locations that were bought specifically as investment properties and proved attractive to young professionals (Gray and McAnulty, 2008).

As in the rest of the UK, an exogenous factor that became very significant after 2004 was the sudden sustained increase in the number of migrant workers who came to Northern Ireland after the accession of eight Central and Eastern European countries to the European Union (the A8 countries) in May 2004[24] and, initially at least, found accommodation in the private rented sector (Phillimore, 2008; NIHE, 2009). Indeed

[23] Analysis of the 2011 House Condition Survey indicates that more than 25,000 ex-NIHE properties were now in the private rented sector.

[24] Beatty *et al*. (2006) estimated that in the twelve months to 30 June 2005, net international migration had resulted in almost 5,000 additional individuals in Northern Ireland.

the 2011 Census estimated that there were more than 30,000 people from the A8 countries living in Northern Ireland.

In addition, the growing number of students seeking privately rented accommodation was a significant factor in Belfast, Derry/Londonderry and Coleraine. A recent study that has highlighted the enormous impact that the growth in student numbers has had on a local housing market in South Belfast (Gray and McAnulty, 2020).

In the period following the housing market crash and subsequent deep recession in Northern Ireland, the ratio of house prices to incomes fell again to such an extent that superficially it appeared the issue of affordability for first-time buyers had been largely resolved[25]. However, a deep recession, growing insecurity of employment and more cautious lending policies by banks and building societies in terms of lending criteria and deposit requirements meant that affordability continued to be a significant issue, all be it caused by a somewhat different combination of factors (NIHE, 2012). A new affordability index developed by the University of Ulster on behalf of the Housing Executive reflected this. In particular, it combined the concept of an 'affordable limit' (that reflected the ratio of maximum allowable loan to incomes) with an 'access deposit gap' (that measured the level of deposit required based on first quartile house prices and disposable income) that formed the basis for an 'arbitrary savings ratio' that estimated the time that would be typically needed to save a deposit based on house prices and median incomes. The resultant composite index indicated that in 2011, although there were significant geographical disparities in affordability, three housing markets areas [(i) Belfast, (ii) Lisburn and Castlereagh and (iii) Derry/Londonderry/Strabane/Limavady] showed clear affordability pressures (NIHE, 2014). The overall effect was that a significant number of first-time buyers continued to have no alternative but to seek accommodation in the private rented sector or remain there for longer.

[25] The average house price in NI fell from its peak of £250, 586 in Q3, 2007 to £137,219 in Q4, 2011 (NIHE, 2012).

Finally, it was clear that as in the rest of the UK there was a significant shift in Government attitude and policy towards the private rented sector. A stated intention of Government proposals on future housing policy published in the mid-1990s was "to sustain the remainder of the sector and provide the opportunity for its revival through encouraging more investors into the market" (DoENI, 1996:47). A joint Department for Social Development/Housing Executive Strategic Framework for renting privately aimed to "promote and sustain a healthy private rented sector, which offers choice and flexibility" (DSDNI/NIHE, 2004:13).

The Private Tenancies (Northern Ireland) Order 2006 was a major piece of legislation designed to address unfitness and disrepair in the sector through enforcement procedures and rent control, as well as clarifying and raising awareness of both landlord and tenant obligations. Following the restoration of the Northern Ireland Assembly in 2007 and the transfer of strategic responsibility for the sector to the DSDNI, a new strategy was published that was designed to address the lack of progress in relation to management issues and included proposals to deal with this by introducing mandatory landlord registration as a first step towards the better regulation of the sector and extending Notice to Quit periods. The legislation also mooted the need for addressing landlord-tenant disputes in relation to deposits and a new fitness standard for the sector (DSDNI, 2010). These policy goals were repeated in the DSDNI's *Facing the Future: Housing Strategy for Northern Ireland* consultation document that had as one of its key aims "Making the private rented sector a more attractive housing option" (DSDNI, 2012:16) through the introduction of a landlord registration scheme and a scheme to protect tenancy deposits[26].

3.8 Conclusion

This chapter has examined the policy literature and some of the associated academic studies that have underpinned Government guidance on housing market analysis undertaken as part of the planning for housing process in the UK. It began by briefly tracing the origins of evidence-based policy and planning and the challenges of incorporating economic theory into a process traditionally dominated by

[26] These policy goals found their legislative expression in the *The Landlord Registration Scheme Regulations (NI) 2014* and the *The Tenancy Deposits Schemes Regulations (NI) 2012* respectively.

demographic analysis and reflected in a disconnect between economists and spatial planners, despite increasing Government emphasis on market solutions to meeting future housing requirements.

However, by the early years of the new millennium there were growing indications that policy makers were giving greater credence to recommendations by leading housing economists that planning for future housing requirements should take on board more direct economic evidence. This process was reflected initially in Scotland in the transition from housing needs assessment that focused on social housing to a much more holistic housing market analysis (Local Housing Systems Analysis) that recognised that social housing was not isolated from the wider housing market or developments in the local economy as the basis for planning for housing. In England, there were a series of policy milestones that mirrored the transition in Scotland. The Labour Government's Planning Green Paper (2001) heralded a recognition of the importance of planning to economic prosperity and culminated in 2004 in a major reform of the planning system. A new focus on 'Regional Spatial Strategies' reflected the emphasis to be given to a much more integrated approach to planning that was to be informed by the market and undertaken in a more effective collaborative manner.

This new approach to planning was reinforced by the publication of two reports. Firstly, the Barker report (2004) that specifically recommended paying more attention to 'market signals' in the planning for housing process and ensuring that future housing requirements be informed by sub-regional and local housing assessments. Secondly, the DTZ Pieda Consulting report (2004) that emphasised the need to ensure that planning for housing was not only an integral part of the broader spectrum of local authority activities, including economic development, but also the importance of collaboration between local authorities.

A key component of the new Regional Spatial Strategies that provided the framework for land use planning at the local level in England was the identification of the required scale and distribution of new housing. Planning Policy Statement (PPS 3) published in 2006 and more detailed methodological guidance published by the DCLG the following year emphasised the importance of a shared evidence base on housing

need and demand that would be provided by a Strategic Housing Market Assessment. As in Scotland, the geographical framework for these strategic assessments was to be housing market areas (HMAs) that recognised the functional linkages between places in which people lived and worked.

However, academics rightly pointed out that although Government guidance in England was grounded in economic theory underpinning the concept of functional HMAs, in practice it did not provide sufficiently specific advice in terms of the utilisation of key data sources, resulting in uncertainty in the practical application of HMAs and in turn damage to the reputation of SHMAs. This problem was compounded in 2010 following the election of a new Conservative-led Government that abolished the strategic regional planning function and pursued a 'localism' agenda that transferred decision-making powers in relation to planning for housing back to local authorities. A new National Planning Policy Framework aimed to speed up the planning process facilitated by a 'presumption in favour of sustainable development'. It tasked local authorities with 'objectively identifying' the need for market and affordable housing, taking account of market signals, but also reinforced the need to undertake SHMAs and collaborate with other local authorities where HMAs cross boundaries, confirming that the HMA framework underpinning SHMAs was still seen as a viable tool in the quest for a robust evidence base to support the development of sub-regional and local housing strategies.

However, academics have not been uncritical about the SHMA experience in England. Ferrari *et al*. (2011), in particular, highlighted conceptual, methodological and process-related weaknesses with the practical application of the SHMA process in many local authorities. More specifically he highlighted the fact that although there were a small number of local authorities that defined HMAs in functional terms, using migration self-containment as the primary criterion, in the majority of cases, boundaries tended to reflect administrative and political convenience.

The attempt by the NHPAU (Baker, 2010; Jones *et al*., 2010) to develop a consistent HMA geography for England likewise demonstrated a high level of inconsistency in the approaches being adopted across local authorities. Lack of definitional clarity and complexity of application undoubtedly meant that that policy makers' and planners'

initial enthusiasm for functionally defined HMA and submarket boundaries waned somewhat after 2010. In 2015 Government guidance on SHMAs was withdrawn and replaced by new guidelines that still required local authorities to use functionally defined HMAs as the framework for their analysis. The delineation of HMAs was to be based on analysis of house prices and migration self-containment but relevant guidance lacked the required level of detail and reference to a single agreed geographic framework. The result was an even greater level of inconsistency that often resulted in lengthy, complex debates in examinations in public dealing with planning applications for new homes.

The Government's White Paper (DCLG, 2017a) attempted to address this issue by proposing a simplified standardised approach to ensure greater consistency and transparency, a methodology dominated by central government estimates of household growth and local estimates of affordability (house price to earnings ratios). However, it appeared to herald a retreat from the use of functional HMAs as the geographical framework for assessing future housing requirements and a reversion to local authority boundaries having primacy, where the housing need for any larger area is merely the sum of the housing need assessments for each local authority. The revised National Policy Planning Framework (MHCLG, 2019a) and the associated Planning Practice Guidance (MHCLG, 2019b) reflect this position.

In stark contrast to recent developments in England, policy and practice in relation to the spatial framework for analysing future housing requirements in Scotland have followed a much more consistent trajectory. The use of functional HMA boundaries was enshrined in comprehensive guidelines published by Communities Scotland (O'Sullivan *et al*., 2004) and this good practice has continued to be reflected in Scottish planning policy documentation since (Scottish Executive, 2008; Scottish Government, 2014, 2014a, 2018). Indeed the most recent published policy document addresses the very problem that has bedevilled the planning system in England (the lengthy delays experienced by planning applications for new dwellings) by confirming that the methodological approach will not need to be scrutinised at public examination in Scotland if it is based on a 'robust and credible' HNDA that is

prepared on the basis of both the functional housing market area and local authority level and is in line with the Scottish Government's HNDA Guidance.

In Northern Ireland, the situation is still somewhat confusing. The original Regional Development Strategy (DRDNI, 2001) undoubtedly marked a significant step forward in terms of recognising the role of planning, including planning for housing, as central to economic prosperity. The planning guidelines (DRDNI, 2005b) that emerged following publication of this strategy put in place a modus operandi that resulted in the Housing Executive providing valuable analysis to underpin the Development Plans that were being produced by the Planning Service from the early 2000s onwards. However, as Palmer (2007) highlighted, there continued to be an issue with regard to the relationship between housing need assessment and the wider housing market context. The Housing Executive attempted to address this by commissioning an experienced research team to produce a consistent set of functional housing market areas for Northern Ireland. This was successfully achieved in 2010 and followed by a housing market analysis for each of the 11 HMAs identified.

However, despite this there is no evidence to suggest that the Department for Regional Development seriously considered taking on board functionally defined HMAs as the basis for estimating future housing requirements either for the HGIs contained in the *Regional Development Strategy − 2035* (or its Development Plans which were required to view the HGIs as material considerations). Similarly, the most recent methodological statements contained in the 2012-based and 2016-based HGIs make no reference to functional HMAs as the basis for analysis. The draft Local Development Plans currently being produced by the 11 Councils following transfer of development planning responsibilities to them in 2015 are statutorily bound to take cognisance of the HGIs and will thereby reflect them and the spatial framework on which they are based.

The foregoing discussion supports an overall assessment that Scotland has taken the most consistent approach to the use of functional HMAs as the spatial framework for estimating future housing requirements. In England SHMAs marked a highpoint in terms of commitment to functional HMAs, but inadequate guidance on best practice in operationally delineating HMAs and increasingly the complexity and inconsistency

of application exacerbated lengthy delays in the planning system and undermined confidence in their use. In Northern Ireland the Regional Development Strategy and the housing market analyses produced by the Housing Executive marked significant steps forward in the transition from housing needs assessment to housing market analysis, but the lack of joined up government and the transfer of planning powers to local authorities has set this progress at risk.

However, regardless of the level of commitment to functionally defined HMAs in either GB or Northern Ireland, what clearly emerges from this analysis of policy frameworks is that in neither Scotland, England nor Northern Ireland has any real cognisance been taken of the rapid growth of the private rented sector. The data that underpins the analyses in all three jurisdictions is overwhelmingly drawn from sources pertaining to the owner-occupied sector and therefore adds credence to the importance of the research proposition set out in the concluding paragraph of Chapter 2 that indicated the need for the delineation of the spatial framework underpinning housing market analysis and planning for housing supply to reflect tenure-related differences in the patterns and purpose of household migration**.**

This point is reinforced in the penultimate section of the chapter that emphasises the very significant role that Government policy has played in the rapid growth of the private rented sector. It provided an overview of research that highlighted a number of common drivers of the rapid growth in the private rented sector both internationally and in the context of the UK, including the changing structure of labour markets, different patterns of household formation, the widening disparity between incomes and house prices, the deregulation of financial markets, the financialisation of housing and the growing emphasis by Governments on market solutions to address housing issues.

The specific combination of factors encouraging the growth of the private rented sector in the context of Northern Ireland were discussed in more detail, including the 'Peace Process', high levels of Government spending and the robust economic growth that supported rising incomes that culminated in an unsustainable housing boom followed by the inevitable housing market collapse and subsequent economic crisis. Indeed, both the 'boom' and 'bust' encouraged the growth of private renting

in the specific context of Northern Ireland. In the case of the former, increasing affordability problems for first-time buyers competing in the housing market with investors driven by the attraction of rapid capital appreciation over a short period of time. In the case of the latter, although house prices dropped rapidly, first time-buyers faced not only a much more uncertain labour market, but also significantly more restrictive lending criteria on the part of banks and building societies. The overall impact of this amalgam of inter-related factors on the tenure structure of Northern Ireland's housing market, as in the rest of the UK, was heightened by a re-orientation of Government policy that was designed to make the private rented sector a more attractive long-term housing option.

Chapter 4 Methodological Considerations

4.1 Introduction

The previous two chapters examined the voluminous academic and policy literature on the evolution of urban spatial structures and housing market areas (HMAs), primarily though not exclusively, in the context of the UK, a literature in which the delineation of functionally defined housing market areas has increasingly been seen as a meaningful starting point for the housing market analysis that underpins estimates of future housing requirements at the sub-regional level. The methodological approaches to defining housing markets in the context of the UK were examined from both an academic and policy perspective, methodologies that are to a greater or lesser extent grounded in economics based theories of housing markets, theories predicated on the triangular relationship between employment, migration and residential location.

Chapter 2 also explored the concepts of spatial arbitrage and migration self-containment that are fundamental to the definition and delineation of local housing markets and submarkets in the UK. It also noted some inherent, and acknowledged, methodological (often data-related) weaknesses in their practical application. However, it also highlighted the fact that academic studies had paid insufficient attention to the impact of the growth of the private rented sector – a tenure which now forms almost 20 per cent of the housing stock in each of the jurisdictions in the UK. Chapter 2 highlighted the fact that this theoretical neglect of the private rented sector was mirrored in policy and practice, and concluded by postulating that:

> Functionally defined housing market areas and submarkets provide a more meaningful spatial framework for housing market analysis and planning for housing. However, given the growing importance of the private rented sector, this framework needs to appropriately reflect any tenure-related differences in household migration patterns.

This chapter examines the methodological framework for both examining this proposition and addressing the overall objectives of the study (Chapter 1). In doing

so it forms a further element of the structural framework that guides the overall study (Figure 4.1).

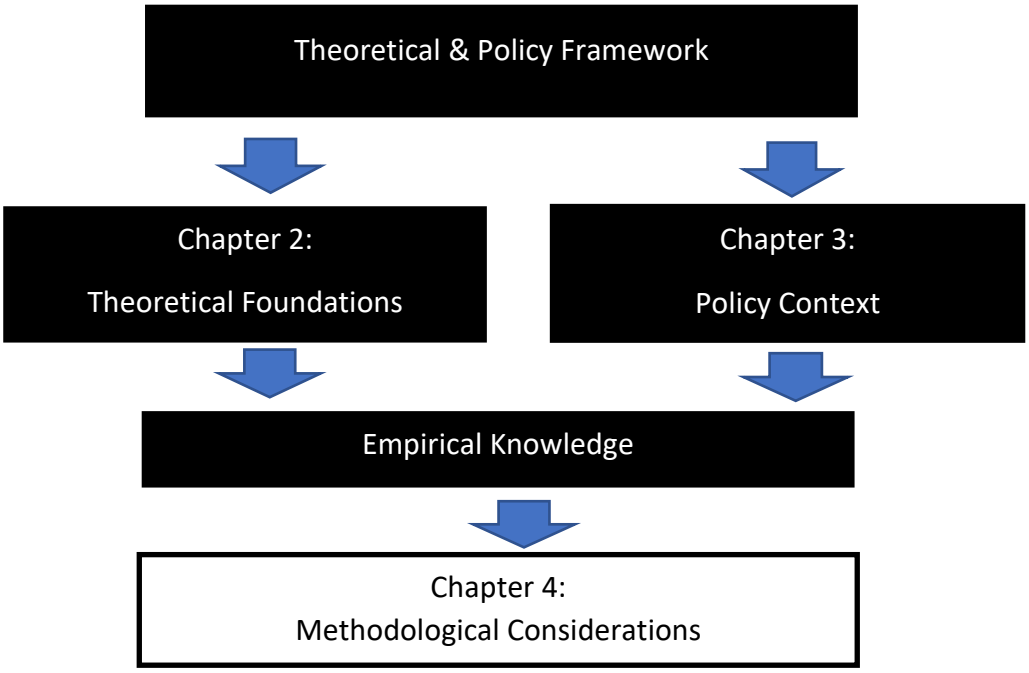


Figure 4-1: Chapter 4 in its structural context

Chapter 4 begins by providing an insight into the conceptual framework, which is best described as post-positivism, as well as the associated ontological and epistemological perspectives that guide the methodological approach, before examining more specific issues such as data sources, data quality and analytical methods.

4.2 Research Paradigms in Social Science

Guba and Lincoln (1994) provide a four-fold typology of research paradigms in the social sciences (Table 4.1), a typology that has helped guide the selection of the most appropriate research paradigm for this thesis, as well as the associated ontological, epistemological and methodological approaches. This typology defines a paradigm as "the basic belief system or world view that guides the investigator, not only in choices of method but in ontologically and epistemologically fundamental ways" (ibid.:105). These basic beliefs "are not open to proof in any conventional way" (ibid.:108) and merely reflect a researcher's perception of the nature of reality, their place in it and their relationship to its interacting parts.

Table 4-1: Research paradigms in the social sciences

Item	**Positivism**	**Post-positivism**	**Critical Theory *et al*.**	**Constructivism**
Ontology	Naive realism – 'real' reality but apprehendable	Critical realism – 'real' reality but only imperfectly and probabilistically apprehendable	Historical realism – virtual reality shaped by social, political, economic, ethnic and gender values; crystallised over time	Relativism – local and specific constructed realities
Epistemology	Dualist/ objectivist	Modified dualist / objectivist; critical tradition/community; findings probably true	Transactional/ subjectivist; value mediated findings	Transactional/ subjectivist; created findings
Methodology	Experimental/ manipulative; verification of hypothesis; chiefly quantitative methods	Modified experimental / manipulative; critical multiplism; falsification of hypotheses; may include qualitative methods	Dialogic / dialectical	Hermeneutical / dialectical

Source: Guba and Lincoln, 1994:109

Accordingly, Guba and Lincoln (1994) examine each of the four basic research paradigms in turn and put forward the ontological and epistemological standpoints[27] as well as the methodological approaches that in the social sciences would sit most comfortably with these paradigms:

[27] Ontological issues address the question of what is the nature of reality and whether the social world should be viewed as something that is external to human beings or something that is continually being shaped by them. Epistemological issues deal with the question of what is the relationship between the researcher and knowledge of the external world and what constitutes acceptable knowledge of the social world (Guba and Lincoln, 1994; Bryman, 2001).

Positivism: the position that has been dominant in both physical and social sciences for centuries. Ontologically, it is assumed that an 'apprehendable reality' exists driven by underlying laws and mechanisms, and that knowledge is summarised in the form of generalisations, which can take the form of cause-effect relationships. This paradigm can be seen as reductionist and deterministic. Epistemologically the researcher and the 'object' being studied are assumed to be independent. The researcher exerts no influence over it, or vice versa, and the researcher's values and biases are excluded, with the result that replicable results are considered objectively 'true'. The research methods employed are experimental, with research questions and hypotheses subjected to empirical testing in order to verify or reject them.

Post-positivism: a paradigm based on an ontological position characterised as critical realism. It acknowledges that objective reality does exist, but can only be 'captured' and understood in an imperfect manner because of the inadequacies of intellectual processes and techniques and the 'intractability' of social phenomena. Reality is subjected to thorough critical examination in order to arrive as closely as possible to understanding it in all its complexities. The associated epistemological position is modified dualism / objectivism, which recognises that objectivity continues to be a 'regulatory ideal' and relies on external 'guardians' to maximise objectivity, for example, through triangulation and peer review. Findings that can be replicated are considered to be probably true, but there is the awareness that at some stage they could still be subject to falsification[28]. Methodologically, post-positivism relies on 'critical multiplism', in essence triangulation, in order to test (falsify) hypotheses. This methodological approach emphasises the importance of gathering contextual information and eliciting 'emic' views to help understand the motivations of the actors involved in the processes being studied, something that is largely achieved through qualitative research.

Critical theory: in terms of ontology, critical theory conceptualises a reality as a malleable entity that is shaped over time by a combination of economic, social and

[28] A philosophical position associated with Karl Popper who rejected the positivist view that theories could be verified and argued that they could only be falsified, a position supported by the black swan that falsified the proposition that all swans are white (Taleb, 2008).

cultural factors, and is then 'crystallised' ('reified') into social structures that are assumed to be 'real' , i.e. natural outcomes to give a 'virtual' (historical) reality. Its related epistemology is characterised as transactional or subjectivist in that it recognises an interdependency between a researcher and the subject matter being researched, with research findings thus influenced by the values of the researcher ('value mediated'). Guba and Lincoln (1994) note that this position calls into question the dichotomy between ontology and epistemology, because knowledge gained about the real world is inextricably linked with the relationship between researcher and subject matter. Methodologically, it is dialogic and dialectical, characterised by a more discursive approach that necessitates a dialogue between two parties, a dialogue that should be dialectic in order to help change perceptions of the immutability of historical structures and encourage more informed positions that recognise the potential to change these social structures and the methods to do this – a position often associated with Marxist analysis of social reality.

Constructivism: characterised in ontological terms as relativist, social reality is perceived as comprising multi-faceted 'intangible mental constructions' based on social experiences that are specific in terms of location and time, shaped by the people holding these 'constructions'. They are viewed as 'true' – but not in any 'absolute' sense, merely to a greater or lesser extent well-informed and nuanced. These constructions can change over time – in tandem with the associated 'realities'. The related epistemology is transactional and subjectivist – researcher and subject matter are connected 'interactively'. Research findings emerge on an ongoing basis, with the result that once again the traditional distinction between epistemology and ontology become blurred. Methodologically, constructivism is defined as hermeneutical (interpretivist), in that it focuses on interpretation as well as dialectical, with constructions of an individual or group being generated and clarified through ongoing interaction between the researcher(s) and individuals/groups participating in the research. Ultimately, the research aims to develop a 'consensus construction' that is better informed and more illuminating than previous ones and incorporates the 'etic' perceptions of the researcher.

Guba and Lincoln (2000) correctly point out that the differences in the assumptions underlying these research paradigms "cannot be dismissed as mere philosophical differences; implicitly or explicitly, these positions have important consequences for the practical conduct of inquiry, as well as for the interpretation of findings and policy choices" (ibid.:112). Positivism and post-positivism emphasise the importance of emerging generalisations and causal relationships that add to the 'edifice of knowledge' and can serve as a basis for predicting behaviour and in turn for policy decisions. Research quality is measured by validity (internal and external), reliability and objectivity (neutrality on the part of the researcher). On the other hand, in the case of critical theory, knowledge is built up through the dialectic of historical revisionism to provide increasingly more informed insights that can be generalised for a range of similar economic, social and political contexts. Quality is provided by ensuring appropriateness of this context for the research findings and the extent to which they clarify and act as a stimulus to action. Finally, constructivism adds to the 'edifice of knowledge' through a dialectical process that leads to an increasingly sophisticated worldview that synthesises a variety of constructions, with quality assessed using the criteria of trustworthiness (credibility and transferability) and authenticity.

4.3 Research Paradigms in Spatial Planning

Guba and Lincoln (1994) concluded that post-positivists have gained 'hegemony' in the social sciences in recent decades in both academic and policy circles, although they acknowledge the growing influence of advocates of critical theory and constructivism. Before examining the philosophical position(s) that influenced this thesis[29] more specifically, it is useful to examine the evolution of the paradigms and methodological traditions that have guided research underlying spatial planning, including therefore planning for housing.

While there is undoubtedly a substantial literature on research paradigms and methodologies for the social sciences in general (Kumar, 2011; Bryman, 2011), there are only a limited number of academic publications that examine the paradigms

[29] Guba and Lincoln (1994) are adamant that no researcher should undertake a study "without being clear about just what paradigm informs his or her approach" (p.116).

underpinning the process of conducting research in the field of spatial planning (Healey, 2007). The wider literature on social sciences provides some important pointers but tends to draw on experience from other disciplines such as geography, psychology and criminology. Silva *et al*. (2015) highlight the danger of not focussing on the specific characteristics of undertaking research in planning: in particular, the challenges of utilising the wide range of research methods required to comprehend the diversity of relevant subject matter and insufficient focus on the interaction between subject matter and research methods. Their *Handbook of Planning Research Methods* addresses the lack of a consolidated text addressing the challenges of undertaking research in the field of spatial planning and provides a "bridge between the wider research design and methods literature and the specificities of our field" (Barry, 2016:480).

Silva *et al*. (2015) define planning as "a form of collective action centred around the development of place futures" (p.xxv). They examine its diagnostic characteristics in some detail, contending that the research process is *systematic* (has a clear conceptual framework that acts as a guide and adds rigour to the process of data collection and analysis), *interactive* (there is an emphasis on knowledge sharing) and *practical* (action-orientated in that it will 'make a difference' by bringing knowledge to bear in the real world – including traditional 'scientifically-robust' knowledge but also 'experiential' and local knowledge).

Although there is a considerable overlap between methodological traditions in the natural and social sciences, what makes doing research in the planning sphere inherently distinctive is its multi-dimensional nature and the distinctive framework that this in turn provides for undertaking research as part of the planning process. In addition to being systematic, interactive and action-orientated, there is a focus on spatial relationships, quality of place and political and institutional contexts that is in turn reflected in a diversity of disciplines and methodological traditions (Silva *et al.*, 2015).

This emphasis on scientific diversity is echoed by NÆss and Saglie (2000:729), who note that research designed to improve the knowledge base on which spatial planning operates is "rooted in the social sciences, natural science and the

humanities". In a paper that aims to improve understanding of where research underpinning spatial planning is located in the 'landscape of different epistemological schools', NÆss and Saglie (2000) suggest that there is a dichotomy between research that examines 'substantive' planning issues and 'procedural' ones. Research focusing on planning processes draws much more heavily on non-positivist traditions, while research that explores more substantive issues that aim to ensure a plan has made, or will make, a positive contribution to social reality is often located somewhere between the positivist and post-positivist paradigms – in particular because of the interaction between the physical environment and human behaviour.

Traditionally, planners perceived shaping the physical environment as an effective way of influencing human behaviour, but in recent decades this position has been criticised by academics who argue that human behaviour can be difficult to predict even on an aggregate scale (Guba and Lincoln, 1994). However, unlike Flyvbjerg (2001), who casts doubt on the value of developing predictive theories for social sciences, NÆss and Saglie (2000) use a wider concept of theory: 'context-dependent' (in time and space) and non-deterministic theory recognises the inability to accurately predict human behaviour and developments in society, but is predicated on the assumption that it can provide an indication of the *probable* course of events. Theory in the context of planning research, therefore, should aim to develop probability relationships with validity in particular geographical contexts for certain periods of time.

The current "heterogeneity of coexistent intellectual traditions" (Silva *et al*., 2015:xxx) in spatial planning reflects both its diverse origins and the fact that these traditions did not emerge in linear fashion as 'historically consecutive' paradigms. In the late nineteenth and early twentieth centuries, planners focussed on 'finding out about places'. Surveys were subsequently undertaken to elicit the characteristics of particular geographical locations and their future needs. It was an essentially empirical positivist approach: the data collected was regarded as factual and there was little analysis of cause-effect relationships. In parallel, a tradition associated with French geographers, in particular, emphasised the culture or 'sprit' of a place. The work of Patrick Geddes combined these two traditions, emphasising the need to

synthesise the knowledge gathered on the economic, social, political and biological influences on people's lives to provide a 'sense of place' (Silva *et al*., 2015), a fusion that was to have a major influence on subsequent research underpinning urban and regional planning (Hall, 1996).

By the mid-twentieth century, the earlier domination of the planning profession by architects, surveyors and engineers had been gradually eroded and increasingly replaced by social scientists. In Europe and North America, in particular, economists played an increasingly significant role. Planning became heavily influenced by an essentially Keynsian outlook that pre-supposed a mixed economy, with government providing a framework that encouraged the private sector to deliver economic growth. In turn government policy would ensure that the benefits of this growth were distributed equitably. Research studies that were designed to model important aspects of socio-economic reality and could be used as predictive tools were encouraged. The urban spatial models of Alonso, Grigsby *et al.* (Chapter 2, Sections 2.2.1 and 2.2.2) emerged from this academic milieu and focussed on modelling cause-effect relationships, rather than merely providing the descriptive accounts typical of the Geddes tradition.

However, the intellectual tradition underpinning these models was still essentially positivist, drawing upon neo-classical economics and the methodological approach typical of the natural sciences. They were developed on an assumption of economic and political stability, and a trajectory of increasing economic prosperity. Human behaviour was seen as a rational response to a combination of economic and institutional factors operating in the context of a specific physical environment. The research underpinning them was driven by the hypothesis about relationships and the testing of these hypotheses as the basis for predictive models. In the planning world itself this approach became known as the rational comprehensive model (Taylor, 1998).

By the 1970s, however, a combination of practical experience, philosophical reservations and, increasingly, input from academics challenged the underlying assumptions of the rational comprehensive model based on political and institutional stability and economic development as a linear process. Emerging evidence in

advanced economies of growing inequalities in the distribution of wealth led to a more activist approach that focused on campaigning against social injustice and environmental damage. The broader conceptual framework was provided by critical theory and often associated with a Marxist worldview. Researchers who did not necessarily accept Marxist philosophy, but recognised the importance of critical evaluation, examined socio-political processes and the role of agency, namely the effect of what planners actually do (Silva *et al.*, 2015).

In the latter decades of the twentieth century there was an increasing awareness that, not only was the assumption of political stability and increasing economic prosperity underpinning the rational economic models unrealistic, but in addition estimates of future trajectories were becoming more unpredictable. Neither the advanced western economies based on social democracy nor the socialist models of Eastern Europe and the USSR were able to deliver the promised general prosperity. The periodic economic recessions that traditionally characterised free market capitalism were again becoming more international in character, culminating in a deep world recession (the 'Great Recession') sparked by the Global Financial Crisis of 2007/08. This changing and more uncertain environment meant that "questions of what, why and how to approach place development were much more contested than previously" with identity reality viewed as "complex social constructions, rather than simple, predefined 'realities'" (Silva *et al.,* 2015:xxxiii).

This 'paradigm shift' was reflected in a range of philosophical standpoints, but together they were united in their critique of the positivist assumptions that had underpinned many of the twentieth century models of spatial planning, a critique based on the realisation that no matter how 'real' the world is, it can never be fully grasped because of its complexity and the limits of human sensibilities. Any understanding of the world is, therefore, essentially a partial 'interpretation' that is shaped by the experience and worldview of the observer, requiring them to reflect on the assumptions underpinning their findings, and in the case of critical evaluative research, highlighting particularly the social processes that are taken for granted in every-day life. Methodologically, researchers with this epistemological position make "extensive use of case studies, which are particularly relevant to place-based, spatial

disciplines such as planning" (Silva *et al.*, 2015:xxxiii). Rather than generalising from a particular case study to a wider 'population' this more interpretive research generalises to a proposition from some conceptual framework (Yin, 2009).

This paradigm shift was also reflected in researchers involved in modelling of transport or urban land use systems, where recognition of complexity and uncertainty has generally led to a post-positivist stance, including "a more customised approach that looks at methodologies, models, data and the selection of the one or ones that best fit the problem and goals at hand" (Silva *et al.*, 2015:xxxiv). This thesis reflects this conceptual evolution and adopts what is essentially a post-positivist research paradigm, a framework that recognises that in the last analysis there is an objective real world (in this case one that comprises a plethora of interrelated housing markets that have been shaped by an almost unlimited range of economic, social, political and environmental factors), but that this reality is characterised by a degree of continually evolving complexity that is impossible to fully grasp. However, in line with the position adopted by NÆss and Saglie (2000), the research underpinning this thesis is also premised on the view that 'context-dependent' theory that provides an indication of the *probable* course of events can make a valuable contribution to the planning process.

4.4 Quantitative versus Qualitative?

Methodological discourses on research design in the social sciences have traditionally distinguished between two main approaches: the quantitative and the qualitative. Silva *et al.* (2015) argue that while this is not based on any 'intellectual logic', as researching a particular issue in spatial planning may require the use of both, it is pragmatic by facilitating connections to the wider social research literature. As Guba and Lincoln (1994) showed (section 4.2), both methodological approaches are associated with particular epistemological (what is considered acceptable knowledge of the social world) and ontological (whether social reality is regarded as a phenomena that is external to observers or something that human beings people are continually shaping) positions. In turn, each approach is associated with a range of techniques for collecting and analysing data.

Quantitative research, as the term suggests is primarily concerned with the collection of numeric data. It is associated with a concept of the relationship between theory and research (deductive) that has a close affinity with a positivist epistemological perspective that applies the methods of natural science to the study of society and is underpinned by an essentially "objectivist conception of social reality" (Bryman, 2001:62) in which social phenomena are viewed as having an existence independent of human beings.

The point of departure for this methodological approach is a *theory*, or theoretical position that has been gleaned from a more or less systematic review of the relevant academic literature. This, in turn, provides the foundation for a *hypothesis*, or *research proposition* that brings "clarity, specificity and focus to a research problem" (Kumar, 2011:81) that the actual study can then test. The process of testing is based on the selection of an appropriate *research design* – "a procedural plan that is adopted... to answer questions validly, objectively, accurately and economically" (Kumar, 2011:94) – including a framework for the collection and analysis of data that is followed by a process of operationalisation, whereby *measures* of the specific research *concepts* (such as spatial arbitrage or migration self-containment) are devised. The *survey instrument* (such as the structured interview schedule which lies at the heart of the Northern Ireland House Condition Survey) is designed to ensure that these measures can be calibrated and then administered to complete *data collection*. Data is then processed (*input* and *validation*) to create a database and *analysed*, using a variety of statistical techniques, with *findings* and *conclusions* drawn from this analysis written up in the form of a *report.*

In contrast, *qualitative* research emphasises words rather than numbers in the collection and analysis of data. Its main focus is "to understand, explain, explore, discover and clarify situations, feelings, perceptions, attitudes, values, beliefs and experiences of a group of people" (Kumar, 2011: 104). The qualitative approach is rooted in an interpretivist epistemological orientation (it focuses on meaning from the point of view of an interviewee or participant) and a constructionist ontology (it regards the social world is something that is shaped by the actions of human beings rather than having a separate existence) and employs an essentially inductive

approach to the relationship between theory and research and emphasises the importance of generating theories. Qualitative research generally rejects the methodological practices and norms typical of the natural sciences and instead examines the ways in which individuals understand and interact with the outside world. This focus is reflected in a commitment "to viewing events and the social world through the eyes of the people that they study" and to "probe beneath the surface" (Bryman, 2001:277).

Qualitative research can include one or more of a range of research methods, for example, "participant observation, semi-structured interviews, focus groups, field observation or participatory mapping" (Van den Broeck, 2015:135). However, the starting point for the process is the formulation of general *research questions*. This is followed by the selection of appropriate research *locations* and *respondents*, and the process of *data collection.* The data is then *analysed* and *interpreted* to provide the basis for new *conceptual* and *theoretical* insights that are included in the *findings* and *conclusions*.

Detailed high quality semi-structured interviews, for example, can provide a richness and depth to a study that is not gained via quantitative research. In particular, seeing the world through the eyes of participants yields a much more definitive understanding of the motivations for their actions (such as moving house) and thereby helps to determine the causal relationships that are so important to the evolution of theoretical positions. However, one significant criticism often levelled at qualitative research – and which is of specific relevance to this thesis – is the difficulty of determining to what extent findings that are often based on relatively small numbers of selected respondents are representative of the wider population. However, this misses the essential point about qualitative research – the aim of which is to "uncover deeper meanings in social processes" (Silverman, 2015:140). It does not seek to generalise to a population, but to a theory, thus "it is 'the cogency of the theoretical reasoning' rather than statistical criteria, that is decisive in considering the generalisability of the findings of qualitative research" (Bryman, 2001:283).

Counterposing quantitative and qualitative methods is useful for pragmatic reasons. However, there is a growing awareness among social scientists that this dichotomy has become blurred. Silva *et al*. (2015:xxxv) argue that "developments in social theory and in complexity science... have helped to erode the traditional distinction between quantitative and qualitative research". Bryman (2001) shows, for example, that qualitative researchers do sometimes test previously specified hypotheses and theories, while quantitative researchers frequently study meaning by including attitudinal questions in social surveys based on questionnaires. Indeed Bryman argues that the relationship between epistemology and ontology on the one hand and specific research methods on the other "are best thought of as tendencies rather than definitive connections" (ibid.:428), and that research methods are more 'free-floating' than often assumed, concluding that it is easy to "under-emphasise the significance of practical considerations in the way in which social research is conducted" (ibid.:429). Gerring (2007:12) too, notes that although research is normally classified into (qualitative) case study or (quantitative) large cross-case studies, it is more fruitful to look upon them as 'complements' and argues that researchers "*must* engage both styles of evidence". Having examined the definitional issues surrounding the use of the term case study in some detail, Gerring (2007:21) concludes that "the feature distinguishing the case study format from a sample-based (or 'cross-case') research design is the number of cases falling within the sample – one or a few versus many – and the corresponding thoroughness with which each case is studied… The case study research format is usually limited to a dozen cases or fewer".

In the last analysis "all social research is a coming together of the ideal and the feasible" (Bryman, 2001:24) and no method of research, whether quantitative or qualitative, can be considered "intrinsically better than any other" (Silverman, 2005:6). Quantitative and qualitative should not be considered as 'polar opposites', but as two ends of a continuum, with mixed methods research occupying "the middle of this continuum because it incorporates elements of both qualitative and quantitative approaches" (Cresswell, 2009:3). Du Toit (2015) also makes the point that mixed method research does not merely involve combining both quantitative

and qualitative approaches, it implies that "this 'mixing' and 'combining' takes place through either 'within-method triangulation' or 'between-method triangulation'" (Gaber and Gaber, 2004:228, quoted in Du Toit, 2015:65). In other words, the presence of qualitative and quantitative data in a study is on its own insufficient. In order for it to become a true mixed-methods study, the two approaches must be used "'in tandem' so that the overall strength of a study is greater than either qualitative or quantitative research" (Cresswell, 2009:4).

It is this hybrid, mixed-method approach that is considered the most appropriate way forward for this thesis. The mixed-method approach examines research questions and a research hypothesis, which focus on the triangular relationship between residential location, employment and migration within the context of a theoretical framework based on the concepts of housing markets and submarkets, spatial arbitrage and migration self-containment. In order to fully address the acknowledged weaknesses identified in the migration self-containment based HMA / submarket research (Chapter 2), and test the theoretical underpinnings, a large dataset that combines the origin and destination address of migrant households with data on the key attributes of their homes (including tenure) as well as household specific socio-economic and socio-demographic information is the desirable starting position for any such research.

Unfortunately, as in Great Britain, such a dataset does not exist for Northern Ireland. However, data collected in Northern Ireland as part of the NIHCS carried out in 2006, 2009 and 2011, when combined with information on individual dwellings gleaned from Northern Ireland's Valuation List[30], does provide this linked data for a sub-sample of approximately 300 cases (recent migrants). In addition, the 2009 and 2011 Surveys include more qualitative data on the reasons these migrant households decided to move house. This combination of approximately 300 cases, 20 key variables and additional qualitative information effectively places this study in a position along the quantitative-qualitative continuum that justifies the use of the term "cross-case study". In addition, the complementary way in which both

[30] https://lpsni.gov.uk/vListDCV/search.asp?submit=form

quantitative and qualitative methods are used in this thesis would support the contention that it is a true mixed-method study as defined by du Cresswell (2009) and Du Toit, 2015).

4.5 Key Data Sources – the Northern Ireland House Condition Survey

Data sources can be classified into two major categories: *primary* and *secondary*. Kumar (2011) characterises primary data as information gathered by the researcher by means of observation (as a participant or non-participant), interviews (structured or unstructured) or questionnaires (mailed or face-to-face/collected). Secondary sources of data, on the other hand, are already in existence and can be accessed by the researcher as documents (hard copy or online) and include Government publications, Census data and earlier research.

Thus, most of the data analysed in this thesis was drawn from the House Condition Surveys undertaken in three consecutive years (2006, 2009 and 2011), as indicated above. The actual cleaned and largely validated datasets from these three individual surveys were been made available to the author of this thesis by the Northern Ireland Housing Executive for the purposes of this study on the basis of its standard Declaration on Confidentiality and Privacy, that ensures confidentiality and anonymity to the households surveyed. The main source of data must therefore be seen as a secondary one. However, the author's participation in the primary data collection process in his role as the Northern Ireland Housing Executive's Head of Research, indicates that a more nuanced interpretation of this classification is appropriate in the context of this study.

Each of the three surveys was based on a stratified random disproportionate sample, but the sample size and approach to stratification varied. In 2006, the survey aimed to survey 7,250 dwellings (including a household survey of occupied dwellings). The sample was stratified by district council area: 250 properties were selected for each of the 25 local authorities outside Belfast[31]. Belfast itself was divided into four areas (North, South, West and East) on the basis of what have been considered by planners

[31] Each of the surveys took place before the local government reorganisation in Northern Ireland in 2015 that reduced the number of district councils from 26 to 11.

and estate agents as broad “submarkets”, with a sample of 250 properties selected from each of these areas. A response rate of 74 per cent provided an achieved sample of 5400.

The 2009 NIHCS was seen as an ‘interim’ survey to update key indicators in the period between two major surveys on the usual five-year cycle. This was reflected in a lower achieved sample size (2,200) and a different geographical basis for stratification (the proposed new 11 council areas). In 2011, essentially for financial reasons, the Survey was based on an even smaller sample size (2,030), although again a high response rate of 71 per cent provided a sample of more than 1,400 properties. The stratification process was somewhat different again to the previous two surveys and reflected a decision to combine NIHCS data with data from the 2011 Census, and by means of regression analysis, to provide the necessary level of disaggregation for key indicators of housing conditions at LGD and Belfast ‘submarket’ levels.

All three surveys used a weighting and grossing procedure that reflected the separate stages of the sampling procedure and additional adjustments to counteract the effect of a tenure related non-response bias to ensure that the final figures used in the report provide reliable estimates of numbers and proportions based on the total number of dwellings/households in each district council area or Belfast “submarket” (NIHE, 2008, Appendix D; NIHE, 2011, Appendix D; NIHE, 2013, Appendix D). Thorough pre-survey technical briefings of the professional surveyors involved, validation checks built into the software and cross-checking by survey supervisors followed by post-validation checks carried out using photographic material all contributed to ensuring that the data collected was of a high quality (NIHE, 2008, Appendix A; NIHE, 2011, Appendix A; NIHE, 2013, Appendix A). The combination of a consistent, statistically sound sampling strategy and the quality assurance process has ensured that the secondary data utilised in this thesis meets the validity, objectivity and transferability requirements of robust quantitative research.

Although the sample size for each of the three House Condition Surveys under consideration (2006, 2009 and 2011) varies considerably, the number of variables, and indeed the actual data collected, including the format of key variables, remained almost entirely unchanged for each of the three surveys. As its name suggests, the

survey is designed to provide detailed information on the characteristics and condition of Northern Ireland's housing stock regardless of tenure, thereby providing a substantial proportion of the evidence base that enables the Housing Executive to fulfil its statutory duty under the Housing (NI) Order, 1981, to "regularly examine housing conditions and need".

The NIHCS's are not only designed "to provide a comprehensive picture of the dwelling stock and its condition" and how this changes over time, but also "to facilitate a comparative analysis of housing conditions in Northern Ireland with other parts of the UK" and "examine the association between dwelling conditions and the social and economic circumstances of households" (NIHE, 2013:14). In order to fulfil these objectives a wealth of detailed (mainly property-related) information is collected on a 30-page survey form that is then converted into more than 3000 variables in each of the datasets. The 30-page survey form comprises four main sections relating to: the physical attributes of dwellings; additional characteristics of flats/apartments and their communal areas; household related demographic, socio-economic and attitudinal data; and, finally, information on neighbourhood and area (NIHE, 2013). Most of the property information, however, provides the very fine detail on the characteristics and condition of the dwelling stock that enables the Building Research Establishment to populate its complex technical models designed to provide consistent measures of housing quality[32]. Only a small proportion of the available variables are therefore used as part of the actual analysis that forms the core of this thesis, but the dataset "includes a wide range of economic, demographic, housing, social and environmental factors which potentially can influence housing market outcomes" (Bramley and Leishman, 2005:2221) – including the delineation of housing market areas. More detail on the selection of the variables used is included in the next section of this chapter that examines the three-stage process to data analysis.

[32] The key models developed by BRE are: Repairs Model, Housing Health and Safety Standard, Energy Efficiency Model (SAP rating), and Fuel Poverty Model, to be calculated in a comparable way to England – and to a lesser extent Scotland and Wales (who use slightly modified versions of some of the models). Details of these models can be found in Appendices C, F, G and H in each of the three HCS Final Reports (NIHE: 2008, 2011 and 2013).

In order to explore the triangular relationship between migration, employment and dwelling characteristics that lies at the heart of the concept of defining functionally-based housing market areas, however, one important data item is absent from the NIHCS datasets: market valuation/price of the dwellings surveyed. Ideally, this would have come from a recent sale of the property on the open market. However, in most cases this would not have taken place, and at any rate was not collected as part of the data gathered in a survey that was focussed on housing conditions, rather than market valuation. For the purposes of this thesis therefore, the NIHCS data had to be combined with data from Northern Ireland's Land and Property Services (LPSNI) domestic Valuation List, a data source that is publicly available online for each property in Northern Ireland, and considered a reasonable proxy for market price at 2006 and 2011, when average house prices had returned to 2005 levels (Ulster University, 2012). For each of the migratory private rented sector households that were included in the detailed analysis, both current and previous home was traced and the valuations for both properties recorded together with the overall size of the property[33]. Finally, the migration distance between origin and destination properties was added to the database for each of the migrant households with the help of Google maps together with a dummy variable to indicate whether the migrant household crossed a HMA, LGD or submarket boundary. More details on both the variables derived from the original NIHCS dataset as well as the additional variables from the Valuation List and the migratory distance are included in the analytical chapters as appropriate.

4.6 Data Analysis and Presentation of Findings

The process of data analysis and the presentation of the key findings from this thesis is divided into three stages, each of which forms one of the subsequent three chapters. The data analysed are drawn from the three NIHCS datasets and the data gathered for each from origin and destination properties from the LPSNI Valuation List.

[33] The capital value of the 2011 destination properties was included in the original HCS dataset, but was checked with the current data available on the LPSNI website as part of a quality assurance process undertaken by the author.

The first of these three chapters (Chapter 5) focuses on descriptive statistics, contextualised by an overview of the most significant developments in Northern Ireland's housing market during the 2000s – in particular, the housing market boom and subsequent crash and the rapid growth of the private rented sector. Drawing on key data from the NIHCS datasets, this chapter traces the rapidly changing profile of the sector since the start of the new millennium in terms of both dwelling stock and the households living in the sector. However, given the central role played by migration self-containment in the delineation of functional housing market areas, data analysis focuses on households who moved house within the 12 month period prior to the NIHCS[34]. In this chapter, when providing descriptive statistics based on this subset of 'movers' as a whole (and comparisons with owner-occupier migrant households in the owner-occupied sector) some weighted and grossed figures[35] are used to facilitate an overall inter-tenure comparison of the process of migration and the associated socio-economic, demographic and housing stock indicators.

Chapter 6 examines the migratory patterns, the issue of spatial arbitrage and the motivations for migration in some depth using a combination of inferential statistics and more qualitative data. The key variables used in this analysis are set out in Table 4.2. In this chapter, unweighted figures are used for the analysis, as the number of households (observations) with particular characteristics diminishes to the extent that weighting and grossing would give a misleading view of reliability.

Finally, Chapter 7 returns to a more traditional quantitative approach. This chapter represents the culmination of the analytical process. It examines the findings of two binary logistic regression models to illustrate the complexities of the interactions of key variables influencing the housing choices of migrant households. Logistic analysis was specifically developed to overcome the inability of linear regression models to incorporate categorical variables (Field, 2013) and some of the most important NIHCS variables that are relevant to understanding patterns of household migration (such as tenure and employment status) are categorical. Logistic regression not only

[34] This is the cut-off point used in all three NIHCS's, and was chosen to mirror the criteria used by the NI Census in 2001 and 2011.

[35] The weighting and grossing procedure for each of the three surveys remained broadly the same. Differences simply reflected the sampling strategy adopted for each of the surveys.

enables a predictive model to be built on the basis of these categorical variables, it also facilitates the prioritisation of possible associations between variables, enabling analysis to focus on the more significant associations.

The dependent variable in each of the models presented in Chapter 7 permits only two alternative outcomes. This binary variable in the first of the two models presented is tenure (owner-occupied or private rented sector), in the second model it is whether a migrant household crosses an LGD boundary. The two models, therefore, essentially predict the probability of these two 'events' occurring on the basis of a number of socio-economic, socio-demographic and dwelling-related co-variates. The interpretation of the models pays specific attention to a number of important statistical outputs: the log-likelihood statistic to indicate the amount of unexplained information there is in the fitted model, the Wald statistic to assess whether the beta coefficient (β) for a predictor variable is significantly different from zero, the Nagelkerke R^2 value to indicate how much variation in outcomes is explained by the chosen co-variates and the Hosmer and Lemeshow test to indicate whether the model is a good fit. Finally, and most importantly, the interpretation examines the odds ratios (the exponential of β) that act as indicators of the change of odds resulting from a unit change in the predictor co-variates. The modelling process also aimed to achieve parsimony, in other words to achieve a model that balances simplicity with predictive accuracy (Field, 2013).

The variables selected for both the analysis of the migratory patterns in Chapter 5 and 6 and for the logistic regression models in Chapter (Table 4.2) reflect not only what is available from the NIHCS and the LPSNI Valuation List, but also the insights gleaned from the academic literature on hedonic modelling and HMA delineation, reviewed in Chapter 2 of this thesis. They reflect the concepts underpinning hedonic models, including the assumption that consumers prioritise the characteristics of commodities (Lancaster, 1966) and that regression analysis based on individual dwelling characteristics can determine the extent to which individual characteristics contribute to overall market price (Rosen, 1974).

Maclennan (1982) and Malpezzi (2003) highlight the importance of structural characteristics, neighbourhood characteristics and location as the key ones that

differentiate houses in the eyes of potential buyers and tenants. More specific guidance is provided by (Adair *et al*., 1996) in the context of the delineation of Belfast's submarkets and of assessing the relative importance of accessibility in determining house prices in the Belfast Urban Area (Adair *et al*., 2000). Selected variables in these studies are grouped on the basis of being property related (for example, location, sale price, dwelling type and age, floor area, number of bedrooms and need for modernisation/repair), environmental (for example, attractiveness of the area, environmental quality and traffic noise) and census data (for example, homeownership levels and demographic structure).

Similarly, Des Rosiers and Thériault (1995) in their hedonic study of rental submarkets in the Quebec region of Canada, highlight dwelling size, age and quality as being important determinants of rents and therefore property values, alongside location and neighbourhood effects and the characteristics of occupants. Both Des Rosiers and Thériault (1995) and Adair *et al.* (1996) highlight the importance of addressing the issue of collinearity that is inherent in this type of housing market data – something that is applicable to NIHCS data as well.

Table 4-2: NIHCS and LPSNI variables selected for analysis and modelling

Variable Name	Description
schedno	Dwelling schedule number that includes district council code
xdistbe	District council code
ADDRESS	Street name and house number, settlement, postcode (Current address)
FHQADDRESS	Street name and house number, settlement, postcode (Origin address)
TENURE	Tenure (current address)
FHQTEN	Tenure (origin address)
MIGDIST	Migration distance origin to destination (current) dwelling
CrossHMA	Dummy variable – HMA boundary crossed
CrossLGD	Dummy variable – LGD boundary crossed
CrossSub	Dummy variable – Submarket boundary crossed
CAPVAL	Capital value of current dwelling (£) from LPSNI
ORIGCAPVAL	Capital value of origin dwelling (£) from LPSNI
AREA	Floor area (sqm) of destination dwelling
ORIGAREA	Floor area (sqm) of origin dwelling
AgeHRP	Age of head of household (HRP)
FHQHRPES	HRP employment status
HHTYP8	Household composition
FHQHB	Housing Benefit in payment
HHIncome6	Banded annual income (respondent and partner)
FHQPROP	Tenure of origin dwelling
FHQMORE	Reason for moving
Dhomes	Decent Homes Standard pass/fail (destination property)
SAP09	Banded SAP rating (destination property)

4.7 Conclusion

This chapter has set out the methodological framework for addressing both the overall hypothesis and the research proposition that guide the study. It began by exploring a number of fundamental research paradigms in social science, based on a four-fold typology developed by Guba and Lincoln (1994) and outlined the ontological and epistemological positions and methodologies that are associated with each of these paradigms.

This was followed by a more in-depth examination of the somewhat limited academic literature on the paradigms that have guided research undertaken in the field of spatial planning. It highlighted the distinctive multi-dimensional nature of planning related research that has to draw on both the natural and social sciences in addition to having an action-orientated nature and a focus on spatial relationships. Drawing on the historical analysis of Silva *et al*. (2000), who highlighted the heterogeneity of intellectual traditions that currently pervade planning research, the urban models of Alonso, Grigsby, *et al*., which provide the underlying economics-based theory for this study, were characterised as reflecting an essentially positivist paradigm that was combined with neo-classical economic theory to provide models of urban development and assumed a trajectory underpinned by economic and political stability and a general increase in prosperity.

The brief summary of the evolution of research paradigms in spatial planning concluded by highlighting the paradigm shift that took place in the latter decades of the twentieth century, when evidence of growing inequality in the distribution of wealth in advanced economies and a desire to intervene in the struggle for greater social justice and environmental protection resulted in the emergence of a more activist planning research agenda based on critical theory. However, it also noted how the growing vicissitudes of the economic cycle that culminated in the Global Financial Crisis of the mid 2000s, and the 'Great Recession' that followed, strengthened the post-positivist position that is grounded in a greater appreciation not only of the complexity of social reality and the inability of researchers to fully

grasp this, but also the growing economic uncertainty that together have made future predictions less reliable.

This thesis reflects this evolution and adopts what is essentially the same post-positivist position as NÆss and Saglie (2000), who, while recognising the inherent challenges of predicting the future, are of the view that sound research can still provide 'context-dependent' indications of the probable course of events and thus make a positive contribution to plans that will guide future development – in this case the future of housing provision in Northern Ireland.

This post-positivist outlook also provides the framework for utilising the quantitative and to a lesser extent qualitative data that was collected during three House Condition Surveys, supplemented by some key variables from the LPSNI Domestic Valuation list. The combination of quantitative and qualitative methods reflects the growing recognition that the more traditional dichotomy between the two has been replaced by an awareness that they occupy two endpoints of a methodological continuum. This thesis, therefore, can best be described as a mixed methods study, in which 'between-method triangulation' is used to augment the robustness of the mainly quantitative research findings. Given the number of individual households (cases) whose migratory patterns are the subject of more intense examination, and following Gerring (2007), the thesis could also be characterised as 'cross-case' research.

The next three chapters set out the most important findings emerging from the analysis of the composite datasets outlined above. Using descriptive statistics, Chapter 5 focuses on eliciting differences in the housing-related migration patterns of private tenants and owner occupiers in the context of developments in Northern Ireland's housing market between 2001 and 2011. Chapter 6 employs inferential statistics to provide a more detailed analysis of the dataset in order to inform the theoretical debate on the delineation of housing markets and submarkets based on the concepts of spatial arbitrage and migration self-containment by examining in more detail the migratory patterns and motivations of tenants in the private rented sector. Finally, Chapter 7 presents two binomial logistic regression models that

provide deeper insights into the complexity of the web of inter-related factors driving household migration.

Chapter 5 Changing Housing Market Dynamics – the Impact of the Growth of the Private Rented Sector

5.1 Introduction

The focus of this thesis is the changing tenure structure of Northern Ireland's housing market and the implications that this has for estimating future housing requirements. More specifically, it examines the geographical delineation of the boundaries of functional housing markets on which local housing market analysis is based. Earlier chapters have provided a number of contextual perspectives for this, together with the adopted methodological approach. This chapter is the first of three analytical chapters that provide the evidence for addressing the research objectives set out in Chapter 1, and in turn the basis for the overall conclusions and policy implications (Figure 5.1).

Chapter 2 examined the theoretical background to the definition and delineation of housing market areas and concluded that while it is important to undertake housing market analysis on the basis of functionally-defined geographies, almost all the academic work has been based on analysis of the migratory patterns of owner occupiers rather than those of tenants in the private rented sector. This point was reinforced in Chapter 3 through a critical evaluation of the policy literature that emerged in response to the academic research undertaken in the context of the UK – and again demonstrated an overwhelming focus on owner occupation. Chapter 3 also provided an overview of the factors driving the rapid growth of the private rented sector in the first decade of the 21st century and emphasised the role of Government policy in the UK, including specifically in Northern Ireland, in driving this.

Chapter 4 examined a number of methodological issues to be addressed in meeting the objectives that provide the framework for this thesis and emphasised that in the last analysis the actual research process must be regarded as a compromise, a "coming together of the ideal and the feasible" (Bryman, 2001:24). The specific mixed-method research design adopted in this thesis attempts to balance the importance of testing the research proposition set out in Chapter 2, in the context of Northern Ireland, on the one hand, and the size of the subsample of 'movers' on the

other. Given the size of the three 'mover' datasets (n = 215, 94 and 100 respectively), conclusions could be regarded as somewhat tentative. However, this is counter-balanced to a significant degree by the depth of analysis made possible by the range of data available for each of the 'mover' households who participated in the three Northern Ireland House Condition Surveys.

This chapter makes extensive use of descriptive statistics based on these three datasets to address Objective 3 of this thesis:

> *To explore how the socio-demographic and socio-economic characteristics and housing circumstances of migrant households impact on the household migration patterns that underlie the delineation of functional housing markets*.

It begins by providing some key statistics that reflect the changing tenure structure of Northern Ireland's housing market since the beginning of the millennium, and, in particular, the rapid growth of the private rented sector. Bearing in mind the research proposition that guides this thesis, the chapter compares and contrasts the demographic profile, socio-economic characteristics and housing circumstances of private tenants and owner-occupiers – key factors influencing decisions to both move home and trade up or down. An understanding of any significant differences in these factors will provide a platform for the more in-depth analysis of actual patterns of migration in the subsequent chapters. Where appropriate reference is made to sample size to indicate the statistical robustness of any apparent differences.

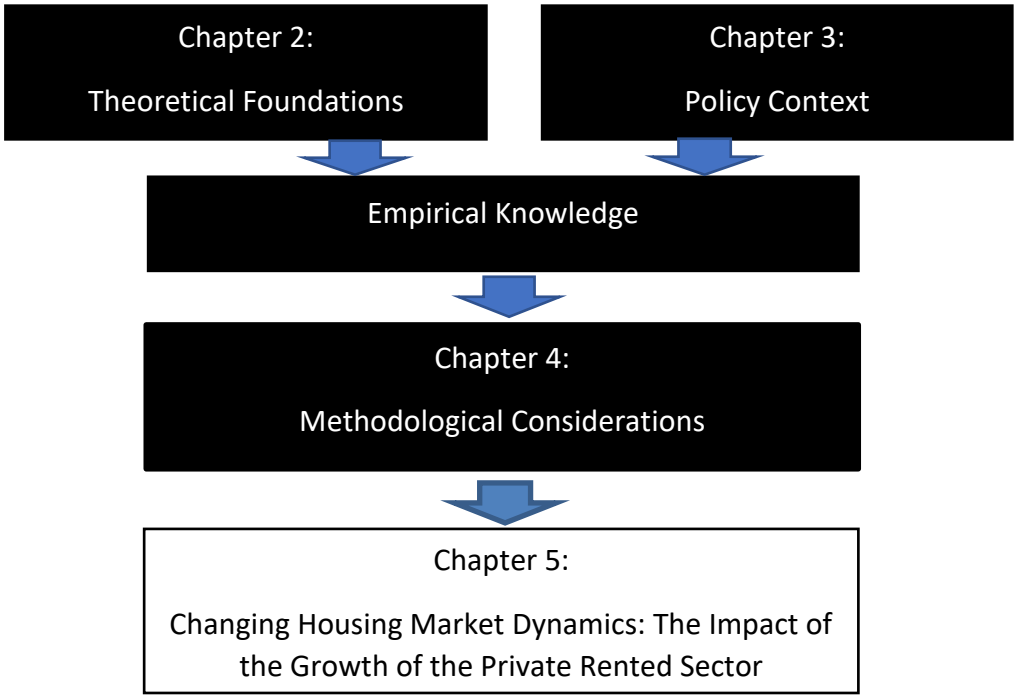


Figure 5-1: Chapter 5 in its structural context

5.2 The Changing Tenure Structure of the Housing Market

Chapter 3 explained how the rapid growth of the private rented sector in Northern Ireland in the first decade of the new millennium reflected changes in a number of underlying economic and factors in combination with a reorientation of Government policy. The overall outcome of these factors was reflected in a significant modification to the tenure structure of Northern Ireland's housing market between 1996 and 2011 (Table 5.1).

Table 5-1: Northern Ireland's housing stock by tenure 1996-2011

	1996 (%)	**2001 (%)**	**2006 (%)**	**2011 (%)**
Owner-occupied	381,200 (63.3)	432,300 (67.0)	468,860 (66.5)	469,100 (61.7)
Privately rented	38,000 (6.3)	49,400 (7.6)	80,870 (11.5)	125,400 (16.5)
Social	154,200 (25.6)	133,900 (20.7)	114,970 (16.3)	110,800 (14.6)
Vacant	29,100 (4.8)	31,900 (4.9)	40,300 (5.7)	54,700 (7.2)
Total Stock	**602,500 (100.0)**	**647,500 (100.0)**	**705,000**	**760,000**

Source: NIHE, 2013

The owner-occupied sector experienced a significant growth between 1996 and 2001 in both absolute and proportional terms. Between 2001 and 2006, it continued to

grow in absolute terms, but contracted in terms of its overall share of the housing market, while between 2006 and 2011 the number of dwellings in owner occupation remained broadly the same, but shrank by almost 5 percentage points in terms of market share.

The social sector experienced a steady decline in absolute and relative terms between 1996 and 2011, primarily as a result of the Statutory House Sales Scheme. Between 1996 and 2006, a total of almost 18,000 Housing Executive dwellings were sold (DSDNI, 2008). However, in 2004 the maximum level of discount available to tenants purchasing their home was capped at £24,000. This significant change in policy combined with the much higher market values assigned to Housing Executive dwellings (at least for the following three years) resulted in a sharp drop in the number of tenants wishing to buy their home. By 2011, the number of dwellings in the social sector had continued to decline, but at a much slower rate.

The relative decline in both the owner-occupied and social sectors were mirrored in substantial growth in the private rented sector, which between 2006 and 2011 in particular experienced rapid growth in both absolute and relative terms as an indirect result of the housing market crash. By 2011, therefore, more than 125,000 (16.5%) dwellings in Northern Ireland were being privately rented, accommodating almost 18 per cent of all households. Indeed, if the 19,100 vacant dwellings[36] that when last occupied were in the private rented sector are added to this total, the proportion of the overall stock in the private rented sector rises to 19 per cent (NIHE, 2013).

5.3 Socio-economic and Demographic Profiles

5.3.1 Origin of migrant households

Between 2001 and 2006, Northern Ireland's housing market experienced a buoyancy that was reflected in a significant increase in the number of households moving to a new home within Northern Ireland[37]. Secondary analysis of the 2001 and 2006 Northern Ireland House Condition Survey (NIHCS) databases shows that both the

[36] Surveyors undertaking the House Condition Survey on the Housing Executive's behalf are specifically required to record the tenure of vacant dwellings when last occupied.
[37] The NIHCS defines these as households who have moved home within the previous 12 months prior to the date of survey.

total number and proportion of households that moved in the 12 months prior to the completion of these Surveys rose from 23,750 (3.9%) in 2001 to 46,050 (6.9%) in 2006. However, there was a disproportionate increase in the private rented sector, where in 2006 there were an estimated 23,400 private tenants (51% of all migrants) compared to only 8,600 (36%) in 2001 (Table 5.2).

Table 5-2: Migrant households by tenure (destination), 2001 and 2006

	2001 (%)	2006 (%)
Owner-occupied	9,000 (38)	14,450 (31)
Privately rented	8,600 (36)	23,400 (51)
Social dwellings	6,150 (26)	8,200 (18)
Total migrants	**23,750 (100)**	**46,050 (100)**
Total households	**615,600**	**664,700**

Sources: NIHCS datasets 2001 and 2006

This contrasts noticeably with an owner-occupied sector characterised by a much more modest increase in the number of households moving home and who, in 2006, only accounted for 31 per cent of all moves. The significant growth in the number and proportion of moves by tenants in the private rented sector (at the time of survey) is obviously partly a reflection of the growth in the absolute and relative size of the sector. However, it also reflects the much higher rates of turnover that are a characteristic of the private rented sector compared to other tenures (McAnulty and Gray, 2010). More detailed analysis of NIHCS data shows that the rate of turnover in the previous year in the private rented sector in 2001 was 17 per cent and rose to 27 per cent in 2006. The comparable figure for the owner-occupied sector only rose from 2 per cent in 2001 to 3 per cent in 2006 – a difference that has a significant bearing on the research proposition.

A comparison of data from the 2006 NIHCS with 2001 figures also provides clear evidence of the upsurge in the number of migrants coming to Northern Ireland from outside Northern Ireland during this period (Beatty *et al*., 2006), an important factor in the sustained growth of the private rented sector. Table 5.3 provide an estimate of the number and origin of migrants who had moved to settle in Northern Ireland within the 12-month period before the survey by tenure.

Table 5-3: Migrants from outside Northern Ireland by tenure, 2001 and 2006

	2001(%)		**2006 (%)**	
	Owner-occ.	*Private rented*	*Owner-occ.*	*Private rented*
NI	8,200 (91)	7,400 (87)	14,100 (96)	18,250 (78)
RoI	0 (0)	200 (2)	250 (2)	1,300 (5)
GB	300 (4)	350 (4)	0 (0)	1,100 (5)
International	0 (0)	450 (5)	100 (1)	2,350 (10)
Missing	500 (5)	200 (2)	0 (0)	400 (2)
Total	**9,000 (100)**	**8,600 (100)**	**14,450 (100)**	**23,400 (100)**

Source: NIHCS datasets 2001 and 2006

Although some caution is required with regard to these figures due to the small sample sizes on which they are based, they provide an early indication not only of the absolute growth in the number of migrants from outside the UK between 2001 and 2006, but also a significant change in the importance of the private rented sector as their destination. The 2001 survey identified no international migrants living in the owner-occupied sector in 2001, but the 2006 survey estimated that by then there were 350. In contrast in the private rented sector the number of migrants from outside the UK rose from an estimated 650 (7%) in 2001 to 3,650 (15%) in 2006 when 10 per cent of all migrants were from outside the UK and Ireland – mainly from Eastern Europe.

5.3.2 Socio-demographic profile of migrant households

The 2006, 2009 and 2011 House Condition Surveys provide evidence of significant tenure-related differences in the household composition[38] and age profile of 'movers' (Table 5.4). In 2006, 'movers' in the owner-occupied sector are predominantly two adults (28%) and small families (26%), or lone adults (19%). By 2009, the pattern has changed somewhat. Two adult households remain the single most common group (30%), but large adult households now form almost a quarter

[38] The definitions of the household composition groupings used in the House Condition Surveys are set out in Appendix 1.

of all movers (24%) in the owner-occupied sector. Figures from the 2011 survey provide evidence of further changes in that the two dominant groups were lone adults (26%) and two older (19%). The inconsistency of the figures relating to the household composition of migrant families in the owner-occupied sector partly reflects sample size, but may well also reflect the volatility in the housing market at that time.

In contrast, in the private rented sector, there was not only more consistency in the type of migrant households, but also consistently smaller proportions in the large family and large adult groups. In each of the three years lone adult and two adult households were generally the two predominant groups and together comprised around a half of the overall total of 'movers' in the private rented sector (46% in 2006; 58% in 2009; 54% in 2011). In addition, in stark contrast to the owner-occupied sector lone parent households comprise a substantial proportion of movers in the private rented sector, although their significance declined (25% in 2006; 16% in 2009; 8% in 2011). Further insights into these inter-tenure differences will emerge in the next chapter of the thesis.

Table 5-4 Migrant households: Household composition by tenure, 2006, 2009, 2011

	2006		**2009**		**2011**	
	Owner occupied (%)	***Private rented (%)***	***Owner occupied (%)***	***Private rented(%)***	***Owner occupied(%)***	***Private rented(%)***
Lone adult	2,700 (19)	6,200 (27)	2,200 (22)	12,300 (33)	2,500 (26)	9,100 (34)
Two adult	4,100 (28)	4500 (19)	2,950 (30)	9,200 (25)	1,650 (17)	5,600 (20)
Small family	3,800 (26)	3,200 (13)	1,150 (11)	6,200 (16)	1,000 (10)	5,000 (18)
Large family	1,600 (11)	700 (3)	1,300 (13)	1,100 (3)	800 (8)	2,300 (8)
Large adult	1,550 (11)	1,800 (7)	2,350 (24)	2,500 (7)	1,500 (16)	500 (2)
Two older	400 (3)	150 (1)	0 (0)	0 (0)	1,800 (19)	2,050 (7)
Lone older	0 (0)	1200 (5)	0 (0)	0 (0)	0 (0)	900 (3)
Lone parent	300 (2)	5,650 (25)	0 (0)	5,850 (16)	400 (4)	2,200 (8)
Total	**14,450 (100)**	**23,400 (100)**	**9,950 (100)**	**37,100 (100)**	**9,550 (100)**	**27,650 (100)**

Source: NIHCS datasets 2006, 2009 and 2011

Socio-demographic differences between the household composition of 'movers' in the owner-occupied and private rented sectors are compounded by an analysis of the age profile of the Household Representative Persons (HRPs). Table 5.5 indicates that there is some common ground between the two sectors in that generally speaking more than 70 per cent of migrant households in both tenures belong to the two age groupings 25-39 and 40-59. However, as in the case of household composition there is much greater inconsistency in the figures for owner occupiers. For example, in 2006 the proportion of 'movers' aged 40-59 was 24 per cent; this increased to 70 per cent in 2009 before falling to 30 per cent in 2011. There were other important differences too, including the much higher proportions of 'movers' in the private rented sector in the 17-24 age group and much smaller proportions in the 60+ age group. Once again the next chapter of the thesis will explore these differences in the light of the underlying reasons for migration.

Table 5-5 Migrant Households: Age of HRP[39] by Tenure, 2006, 2009, 2011

	2006		***2009***		***2011***	
	Owner-occupied(%)	***Private rented(%)***	***Owner-occupied(%)***	***Private rented(%)***	***Owner-occupied(%)***	***Private rented(%)***
17-24	2,000 (14)	7,600 (32)	500 (5)	10,700 (29)	0 (0)	4,200 (15)
25-39	7,700 (53)	9,200 (39)	1,700 (17)	19,900 (54)	4,200 (44)	11,500 (41)
40-59	3,400 (24)	5,250 (23)	7,000 (70)	6,500 (17)	2,900 (30)	9,000 (32)
60+	1,350 (9)	1,350 (6)	800 (8)	0 (0)	2,450 (26)	2,950 (11)
Total	**14,450 (100)**	**23,400 (100)**	**9,950 (100)**	**37,100 (100)**	**9,550 (100)**	**27,650 (100)**

Source: NIHCS datasets for 2006, 2009 and 2011

[39] The household reference person is the member of the household who owns or pays the rent or mortgage on the property. Where two people have equal claim (e.g. husband and wife jointly own the property) the household reference person is the person with the highest annual income. (NIHE, 2008:176).

5.3.3 Socio-economic indicators

Income and employment are crucial factors influencing a household's decision to move from one dwelling to another. The three House Condition Surveys (2006, 2009 and 2011) provide a rich source of data to compare and contrast the profiles of migrant households in terms of their income and employment status.

Differences in the typical household incomes[40] of owner-occupiers and private tenants in general is well-evidenced. Published figures from the NIHCS, for example, show that in 2006 almost three-quarters (70%) of households in the private rented sector had incomes of less than £15,000, compared to approximately two-fifths (41%) of owner occupiers. The picture remained broadly the same in relative terms (and allowing for rising incomes) in 2009 when 63 per cent of private renters and 37 per cent of owner occupiers had incomes of less than £15,000, and in 2011 when 35 per cent of households in the owner-sector had incomes of less than £15,000 compared to a figure of 54 per cent for households in the private rented sector. Figure 5.2 shows that this pattern is broadly reflected in the distribution of the household incomes of owner-occupiers and private tenants who have moved to a new home in the twelve-month period prior to the surveys in 2006, 2009 and 2011, but also that there are significant differences.

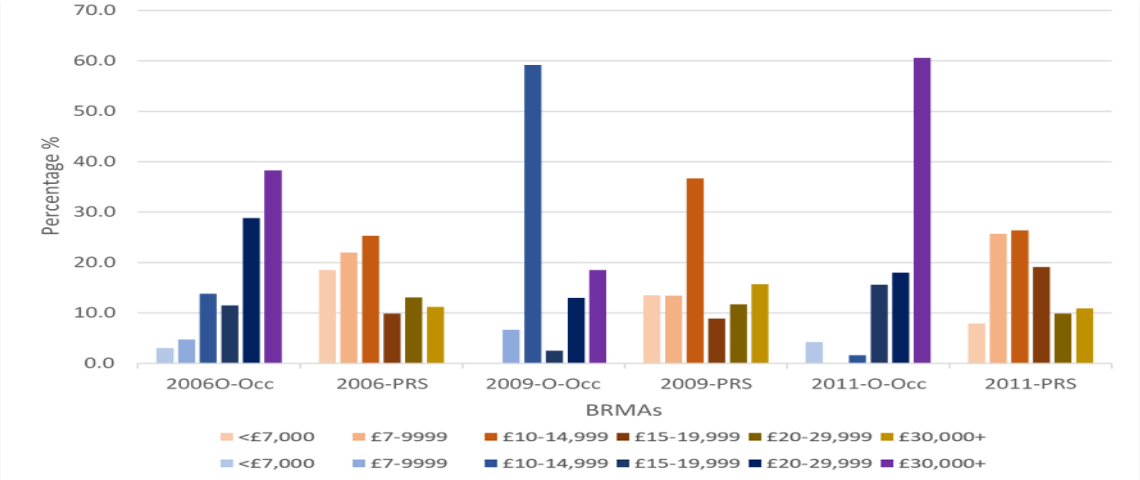
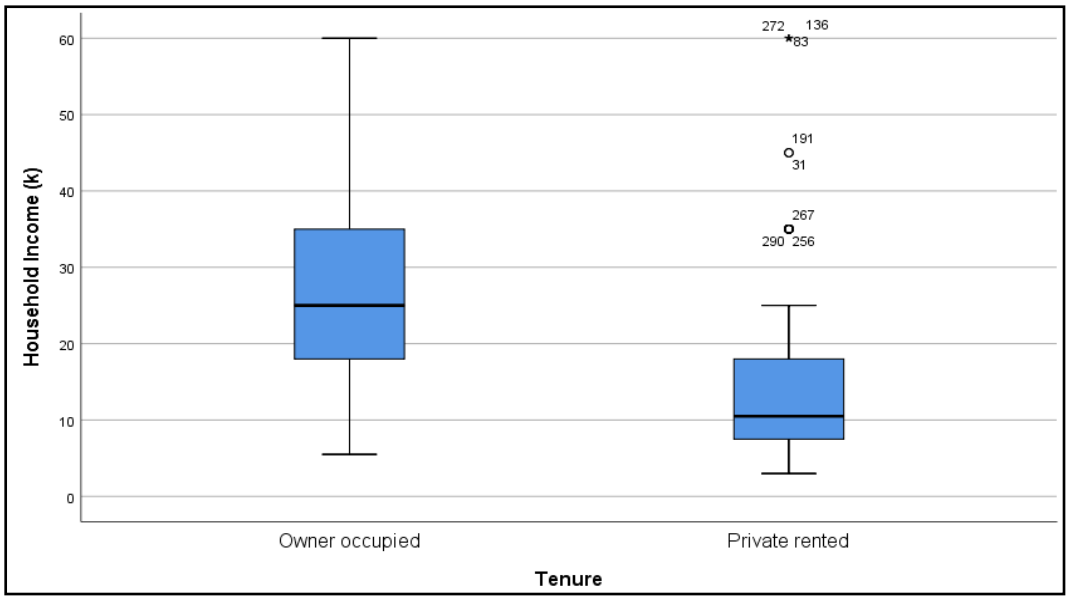


Figure 5-2: Migrant household income by tenure, 2006, 2009 and 2011

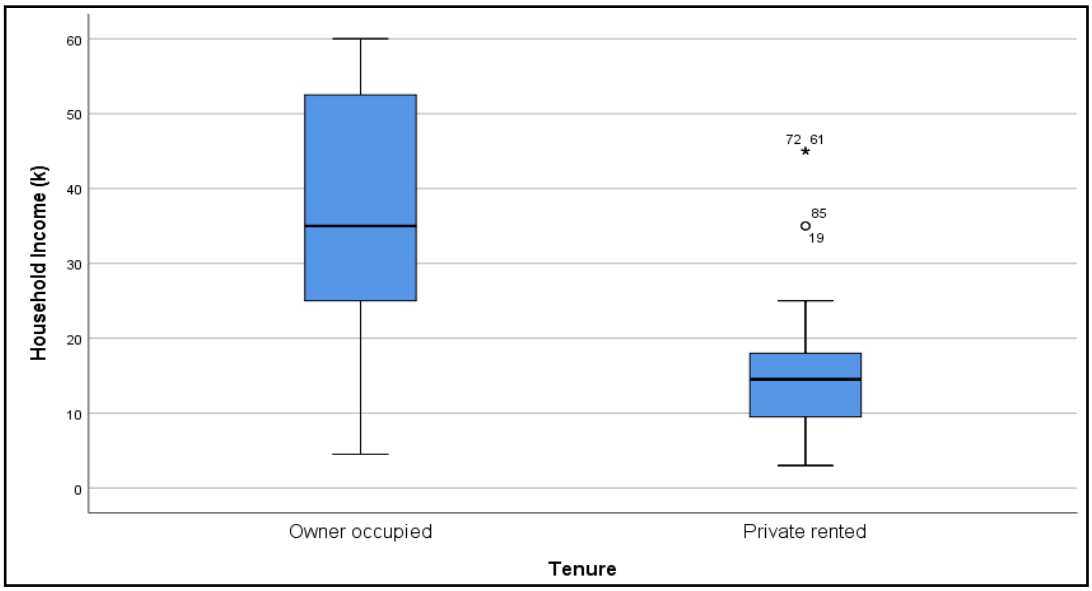
[40] The NIHCS definition of household income includes the income of the household reference person and spouse or partner if applicable.

In summary, approximately two-thirds of migrant households in the private rented sector consistently had incomes in the lower three income brackets, i.e. below £15,000 (66% in 2006; 64% in 2009; 60% in 2011), with the remainder in the upper three brackets. These percentages are significantly different to the ones for the privately renting households as a whole, in that they remain broadly consistent in real terms compared with a decline from 70 per cent to 54 per cent for private tenants as a whole, indicating that the incomes of 'movers' in the private rented sector declined less rapidly than for private tenants as a whole. This contrasts markedly with the pattern for owner occupiers. Figure 5.2 indicates that owner occupiers who moved house in the twelve-month period before the surveys were carried out in 2006 and 2011 are much less likely to be in the lower three income brackets, i.e. £15,000 and below (21% and 6% respectively), compared to owner-occupier households generally (41% and 35%). In addition, the figure for 2009 appears to be an anomaly when 66 per cent of owner occupiers who had moved in the previous twelve months had incomes of less than £15,000 – partly reflecting sample size, but also possibly the unstable market conditions at that time, when following the sharp downturn in the market and the emergence of negative equity on a large scale, a significant number of lower income owner occupiers traded down to a lower value home.

Figures 5.3a and b provide an alternative graphical representation of the income distribution of 'movers' in the owner occupied and private rented sectors. The two box plots for the data from 2006 and 2011 reinforce a number of the inter-tenurial differences. For example, in 2006, the upper quartile household income of 'movers' in the private rented sector is approximately equal to the lower quartile for 'movers' who are owner occupiers. For 2011, this difference is more pronounced, with a difference of approximately £7,000 emerging between the upper quartile private tenants and lower quartile owner occupiers. Likewise, there are significant differences in terms of the distribution of the data. In the case of all four distributions, the data is positively skewed, but for owner occupiers in both 2006 and 2011 this feature is much more pronounced.



(a) 2006



(b) 2011

Figure 5-3: Household income for 'movers' by tenure, 2006 and 2011: Boxplot

Source: NIHCS datasets 2006 and 2011

The contrasting socio-economic profiles of owner occupiers and private tenants who have moved home are also reflected in variations in the employment status of the Household Reference Persons (Table 5.6). These contrasts are apparent for each of the three years the NIHCS was undertaken, but dramatic changes in both the labour market and the housing market mean that these have revealed themselves in different ways.

Table 5-6: Migrant Households: Employment status of HRP by Tenure: 2006, 2009, 2011

	2006		***2009***		***2011***	
	Owner-occupied (%)	***Private rented (%)***	***Owner-occupied (%)***	***Private rented (%)***	***Owner-occupied (%)***	***Private rented (%)***
Working	12,200 (84)	12,100 (52)	5300 (53)	19,750 (53)	6,700 (70)	11,200 (40)
Not Working	200 (2)	4450 (19)	1300 (13)	11,750 (32)	400 (4)	6150 (22)
Retired	550 (4)	1350 (6)	1900 (19)	0 (0)	2,450 (26)	2,400 (9)
Sick/Disabled	900 (6)	1500 (6)	1450 (15)	800 (2)	0 (0)	5450 (20)
Other	600 (4)	4,000 (17)	0 (0)	4,800 (13)	0 (0)	2,450 (9)
Total	14,450 (100)	23,400 (100)	9950 (100)	37,100 (100)	9,550 (100)	27,650 (100)

Source: NIHCS datasets for 2006, 2009 and 2011

In 2006, the overwhelming majority (84%) of 'movers' in the owner-occupied sector were in employment, whereas only approximately one half (52%) of private tenants were employed and almost one fifth (19%) were unemployed. In 2009, following the dramatic downturn in the housing market and the ensuing economic deterioration, when the overall number of owner occupiers moving house dropped by about one third, the proportion of movers in the private rented sector who were working remained roughly constant (53%), while the almost one third (32%) were unemployed. However, the proportion of employed owner occupiers fell to 53 per cent (the same as the figure for private tenants), while the proportion of those who were not working, retired or permanently sick/disabled rose considerably. In 2011 as the housing market stabilised and the Northern Ireland economy started to recover the proportion of owner occupying 'movers' in employment rose again to 70 per cent with an additional 26 per cent retired. In the case of private tenants only 40 per cent were in employment and a further 22 per cent were unemployed.

5.4 Indicators of Housing Quality

5.4.1 Age of dwelling

House Condition Surveys undertaken in Northern Ireland have consistently shown that dwelling age is a robust indicator of housing quality, with the likelihood of a property being deemed unfit for human habitation or failing the Decent Homes Standard increasing with age (NIHE, 2008; NIHE 2013). Table 5.7 provides some useful insights into the age of the dwellings occupied by households who had moved house within the previous twelve months.

Table 5-7: Migrant Households: Age of dwelling, 2006, 2009, 2011

	2006		***2009***		***2011***	
	Owner-occupied (%)	***Private rented (%)***	***Owner-occupied (%)***	***Private rented (%)***	***Owner-occupied (%)***	***Private rented (%)***
Pre-1919	1,550 (11)	5,300 (23)	1,550 (16)	6,400 (17)	1,100 (12)	4,750 (17)
1919-44	2,500 (17)	3.400 (14)	250 (3)	13,450 (36)	1,700 (18)	2,650 (10)
1945-64	700 (5)	3,900 (17)	150 (1)	5,200 (14)	900 (9)	2,100 (7)
1965-80	1,650 (11)	4,600 (20)	1,500 (15)	4,900 (13)	800 (8)	4,400 (16)
1981-2000	3,550 (25)	3,800 (16)	2,050 (20)	2,950 (8)	750 (8)	8,150 (30)
Post-2000	4,500 (31)	2,400 (10)	4,500 (45)	4,200 (11)	4,300 (45)	5,600 (20)
Total	**14,450 (100)**	**23,400 (100)**	**9,950 (100)**	**37,100 (100)**	**9,550 (100)**	**27,650 (100)**

Source: NIHCS datasets for 2006, 2009 and 2011

It indicates that the age profile of the dwellings occupied by migrant private tenants was significantly and consistently older than the age profile of the homes of 'movers' in the owner-occupied sector. In 2006 almost a quarter (23%) of private tenants lived in dwellings built before 1919, compared to only 11 per cent of owner occupiers, while in 2011 the comparable figures were 17 per cent and 12 per cent respectively. In 2009 there was only a percentage point difference between the figures for the two tenures, but this survey included a much bigger proportion of private tenants living

in dwellings in the 1919-44 age bracket (36%) compared to owner occupiers (3%)[41]. At the other end of the scale, the proportion of private tenants living in homes built after 2000 is consistently, for each of the three consecutive surveys (2006, 2009 and 2011), much lower (10%, 11% and 20%) than the percentage of owner occupiers (31%, 45% and 45%).

It is also useful to compare these figures with those that emerge from an analysis of the House Condition Survey data as a whole, i.e. for all private tenants and owner occupiers regardless of whether they moved house in the previous twelve months. Here again the picture is clear and – indeed, as would be expected because of the much larger sample sizes involved – much more consistent across all three surveys. Table 5.8 summarises the key statistics. A much higher proportion of all private tenants occupy pre-1919 dwellings across all three surveys, a picture that is broadly mirrored in the figures for 'mover' households. In contrast, similar proportions of all owner-occupiers and all private tenants occupy post-2000 dwellings. This is in stark contrast to the significant difference in these proportions for 'mover' households and suggests that modernity as an element of housing quality is a much more important factor in housing choice for owner-occupiers moving house than for private tenants – an interesting tenure-based insight into the concept of 'filtering' that envisages the growth of new supply stimulating migration from older to newer dwellings.

Table 5-8: All households: Age of dwelling, 2006, 2009, 2011

	2006		***2009***		***2011***	
	Owner-occupied (%)	***Private rented (%)***	***Owner-occupied (%)***	***Private rented (%)***	***Owner-occupied (%)***	***Private rented (%)***
Pre-1919	79,700 (16)	29,500(31%)	71,100(15)	33,000 (23)	58,300(12)	25,400 (18)
Post-2000	2,500 (17)	3.400 (14)	62,450(13)	18,100 (13)	85,800(17)	20,550 (14)

Source: NIHCS datasets for 2006, 2009 and 2011

[41] It is important to exercise some caution with these figures given the much smaller sample sizes for the 2009 and 2011 survey. This, together with the underlying volatility of the housing market between 2006 and 2011 explains the apparent inconsistencies between the figures for each of the three years.

5.4.2 The Decent Homes Standard

The current statutory standard of housing quality in Northern Ireland is the Fitness Standard as set out in Schedule 5 of the Housing (Northern Ireland) Order, 1992. However, there is general agreement that it is outdated and unsuitable in the light of modern-day standards and over the last 15 years the incidence of statutory unfitness has become so rare in the occupied stock that unfitness figures from the sample based House Condition Surveys have become increasingly insignificant in statistical terms (NIHE, 2013).

In England and Wales, a new more comprehensive standard known as the Decent Home Standard was introduced over a number of years in the early 2000s. In order for a dwelling to meet the Decent Homes Standard it has to (a) meet the current statutory minimum standard for housing, i.e. the Fitness Standard; (b) be in a reasonable state of repair; (c) have reasonably modern facilities and services; and, (d) provide a reasonable degree of thermal comfort. These criteria were defined in more detail by the Office of the Deputy Prime Minister (ODPM) in 2002 (NIHE, 2008).

In Northern Ireland, this Decent Homes Standard was adopted in 2004 for the social housing sector, with a view to ensuring that all social dwellings met this standard by 2010. In England and Wales, however, the Fitness Standard (and therefore the first element of the Decent Homes Standard) was replaced in 2006 by a Housing Health and Safety Rating System (HHSRS) that provided a risk-based assessment of housing quality. In Northern Ireland, the need to develop a new housing quality standard was highlighted in the Department for Social Development's *Facing the Future: The Housing Strategy for Northern Ireland 2012-2017* (DSDNI, 2015). The Department for Communities has been working on developing a new statutory housing quality standard for a number of years and a formal consultation exercise was undertaken in 2016, but so far no new standard has been agreed (Fitzpatrick *et al*., 2020). The analysis below, therefore, is based on the Decent Homes Standard that incorporates the Fitness Standard rather than the HHSRS.

Figures from the 2006 House Condition Survey show that there was a considerable difference between the housing quality experienced by migrant households in the

owner-occupied sector compared to those in the private rented sector. In the case of the former only eight per cent of dwellings failed the Decent Home Standard compared to 31 per cent in the private rented sector. Comparable figures for **all** households in 2006 indicate much higher rates of failure in the owner-occupied sector, but not in the private rented sector, suggesting that prior to the housing market crash, better housing quality may have been a more important factor in the decision of migrant owner occupiers to move home. By 2011, the overall number and proportion of homes failing the Decent Homes Standard had fallen dramatically in both the owner-occupied and private rented sectors. This was partly a reflection of additional new dwellings (although the rate of new construction declined significantly in the wake of the Global Financial Crisis), but also to a considerable extent a reflection of the availability of Government funding for owner-occupiers and private landlords to improve energy efficiency in the home (NIHE, 2013). This general improvement in housing conditions is reflected to an even greater extent in the proportion of both migrant owner occupiers and tenants living in homes that did not meet the Decent Homes Standard. In the case of the former, the number and proportion of homes failing the Decent Homes Standard fell away to zero while in the case of the latter the figures were fairly insignificant. Again, changing housing market conditions may explain these differences where housing quality may be of importance to migrants in both tenures, but also in the case of private tenants where the greater number and availability of new privately rented dwellings may have facilitated the choice of higher quality properties.

Table 5-9: Migrant households and all Households: Failing the Decent Home Standard, 2006 and 2011

	2006		***2011***	
	Owner-occupied (%)	***Private rented (%)***	***Owner-occupied (%)***	***Private rented (%)***
Migrant Households	1,200 (8)	4,400 (31%)	0 (0)	600 (2)
All Households	95,700 (20)	21,400 (27)	38,300 (8)	12,800 (10)

Source: NIHCS datasets for 2006, 2009 and 2011and NIHE, 2008, 2011 and 2013.

5.4.3 Energy Efficiency – SAP Rating

The energy efficiency of a home is also an important indicator of housing quality and is reflected in one of the four criteria that comprise the Decent Home Standard. This criterion is designed to ensure the dwelling provides a reasonable degree of thermal comfort by means of effective insulation and efficient heating. However, the Standard Assessment Procedure (SAP) is somewhat different in that it is the Government's standard method of rating the energy efficiency of a dwelling. The Building Research Establishment (BRE) modified the SAP models developed for England to take into account the greater prevalence of solid fuel and electrical heating in Northern Ireland (NIHE, 2013).

Figure 5.4 shows diagrammatically the substantial improvements in the energy efficiency of the dwellings of migrant households in the both the owner occupied and private rented sectors between 2006 and 2011. For example, the proportions in the lowest two bandings for owner occupiers and private tenants in 2006 were 38 and 61 per cent respectively. By 2011 these two figures had more than halved to 15 and 30 per cent. Conversely, the proportion in the upper two bands had increased from 62 per cent for owner occupiers and 39 per cent for private tenants in 2006 to 85 and 70 per cent respectively, indicating that while there were significant improvements in both tenures, there remained significant inter-tenure differences.

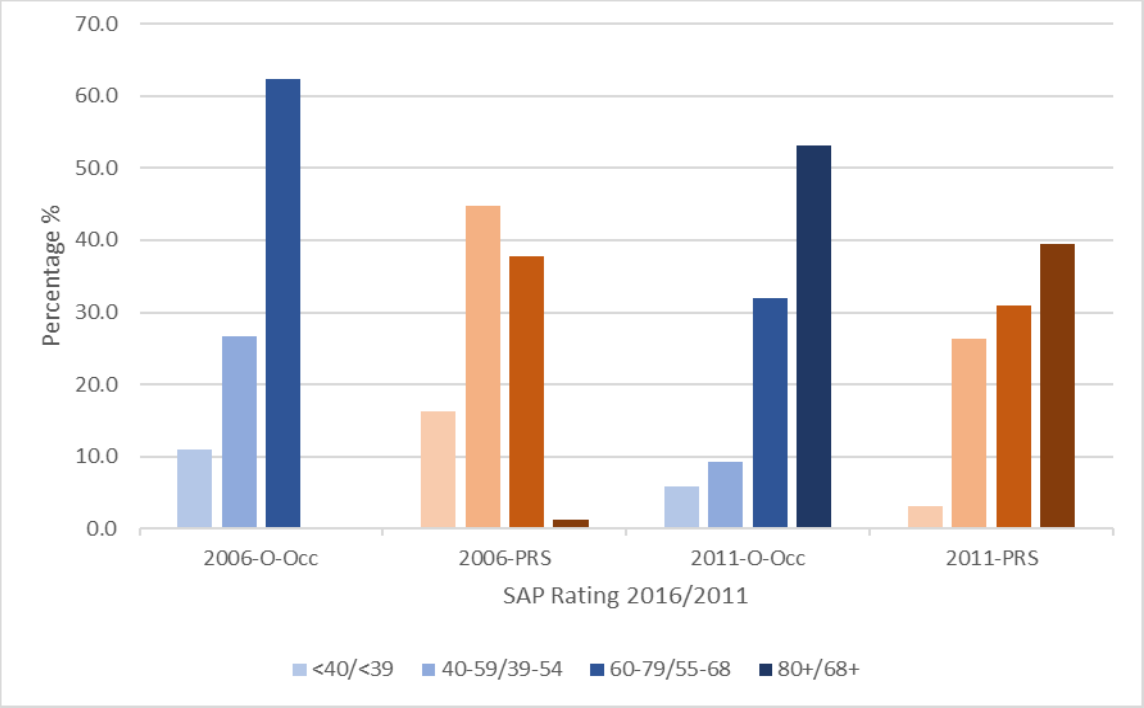


Figure 5-4: Migrant households: SAP rating, 2006 and 2011

Source: NIHCS datasets: 2006 and 2011

5.4.4 Capital Value

The open market price of a dwelling provides an important summary indicator of housing quality – a combination of both the important attributes of a dwelling that determine the value of a specific 'bundle' of dwelling characteristics (see Chapter 2, section 2.3.1) and a measure of the actual condition of the property. Individual dwelling prices for completed open market sales would therefore be the ideal data source for comparative analysis of overall housing quality of 'mover' households in the owner occupied and private rented sectors. However, these are not available in any consistent way for the dwellings and time period covered by the three NIHCS datasets – if only because individual house sales occur only intermittently. The analysis below, therefore, uses capital valuations carried out as part of the revaluation of all domestic dwellings in Northern Ireland in 2005 as a proxy indicator to provide the basis for reasonably consistent inter-tenure comparisons. Valuations carried out in 2005 were therefore reflective of house prices in 2006. Given house price movements following the Global Financial Crash in 2007/08 they were also generally fairly representative in 2011 (NIHE, 2013).

Key capital valuation data from the 2006 and 2011 House Condition Surveys is summarised in the form of two box plot diagrams (Figures 5.5 and 5.6). Comparison of the boxplots in these diagrams reveals some important, though not unexpected contrasts. Firstly, although all four boxplots are positively skewed by a relatively small number of high value properties, there are significant differences in the medians and upper and lower quartiles. In 2006, the median for the owner-occupied sector was £105,000, the 25th percentile £75,000 and the 75th percentile £145,000. The comparable figures for the private rented sector were much lower at £72,500, £60,000 and £95,000 respectively. Similarly, in 2011, the median for owner occupiers was £130,000, the 25th percentile was 80,000 and the 75th percentile £205,000[42]. In contrast, the comparable figures for private tenants were again much lower at £81,250, £63,125 and £95,000.

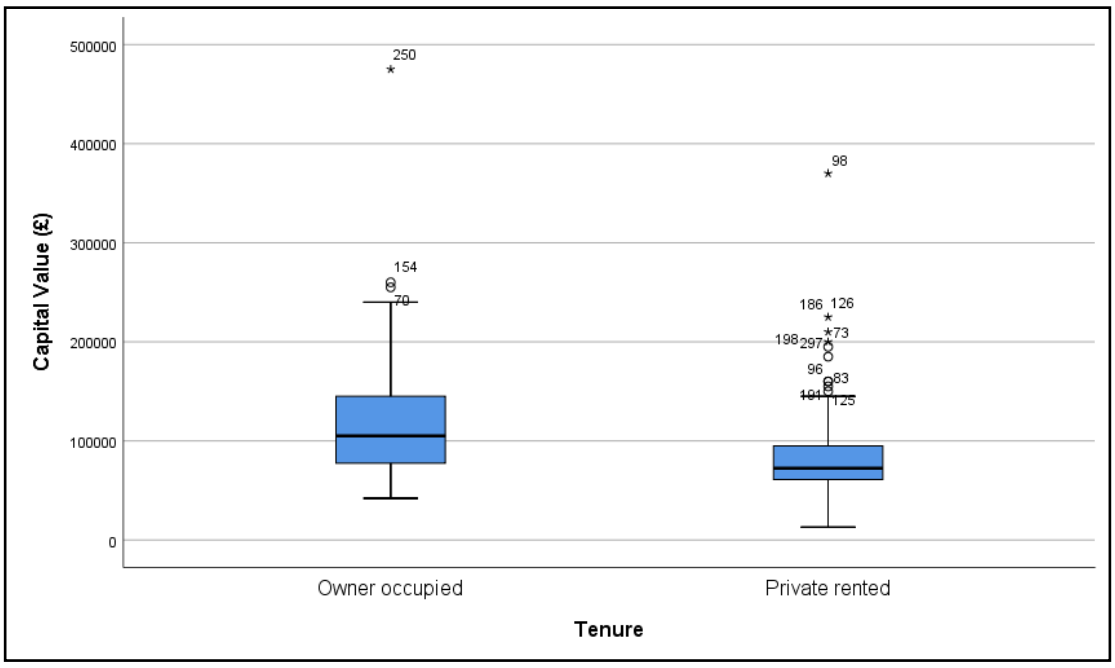


Figure 5-5: Capital value of migrant households, 2006: Boxplot

Source: NIHCS Dataset 2006

[42] The figures for the 2011 owner-occupiers must be treated with caution (n=19) something that is reflected in the apparent small difference between the 75th percentile calculated using SPSS analytics and the actual boxplot.

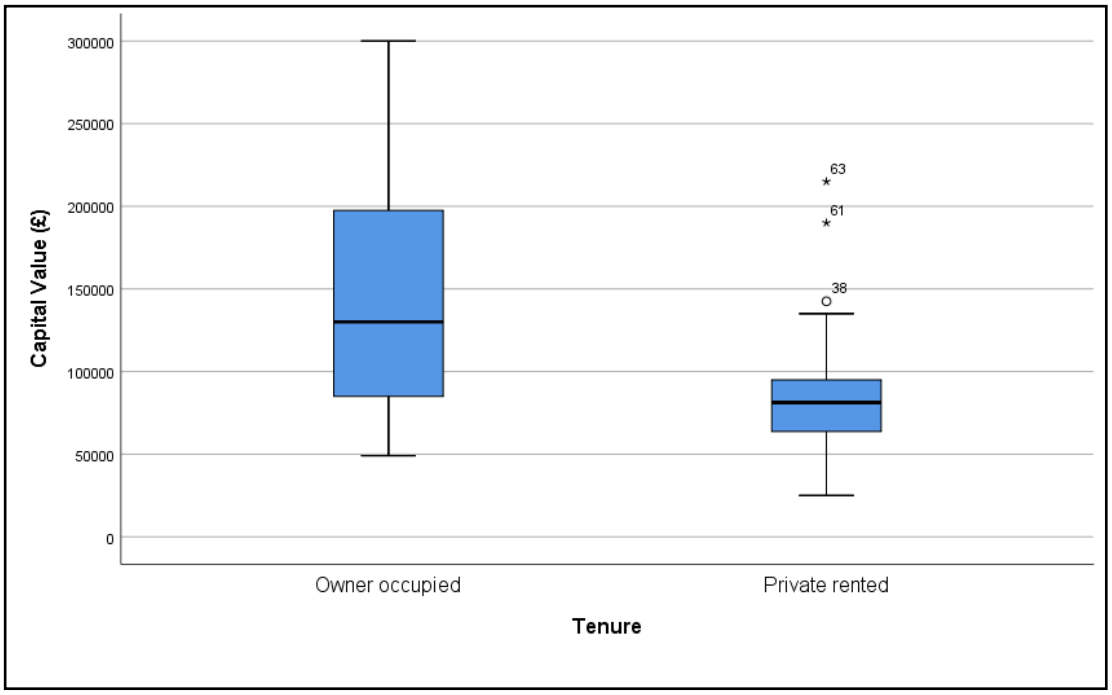


Figure 5-6: Capital value of migrant households, 2011: Boxplot

Source: NIHCS 2011 dataset

In addition, there is an indication that by 2011, the inter-tenure contrast had increased. In the case of private tenants who moved home there was little difference in the distribution of the capital values of these new homes between 2006 and 2011 (the median price only increased by approximately £9,000). In the case of 'movers' in the owner-occupied sector, however, the median grew by £25,000, although again some caution must be exercised because of the small sample size.

5.5 Conclusion

This chapter began by examining the changing tenure structure of Northern Ireland's housing market during the first decade of the new millennium and, in particular, the sustained growth of the private rented sector.

Analysis of data from the 2001 and 2006 House Condition Surveys provided evidence of an upsurge in the number of households in the private rented sector moving home within the twelve-month period prior to the survey and contrasted this with a much more stable turnover in the owner occupied sector. It also highlighted the significant

role played by the sector in accommodating the growing number international migrants following the accession of the A8 countries to the EU in 2004.

The remainder of the chapter focused on comparing and contrasting the socio-demographic and socio-economic profiles of 'mover' households in the owner-occupied and private rented sectors and their housing circumstances in terms of indicators of housing quality. There were significant differences in terms of household composition: migrant households in the owner-occupied sector were much more likely to be two adults or small families, whereas in the private rented sector they were more likely to be lone adults or lone parents. Data in relation to the age-profile of Household Reference Persons was more inconsistent, partly reflecting the significant drop in the number of migrant owner-occupiers following the housing market crash (which in turn impacted on sample size). However, there is sufficient evidence to show that, as would be expected, younger migrant households (aged 17-24) feature much more prominently in the private rented sector while older migrant households (aged 60+) are more common in the owner-occupied sector.

Income and employment status are obviously two of the most important factors affecting housing choice. A more detailed comparison of both income levels of migrant private tenants and owner occupiers revealed not only significant differences between the two tenures, but also differences between migrant households and the overall population. In the case of migrant private tenants approximately two-thirds reported household incomes of less than £15,000 across all three surveys, whereas comparable figures for the private tenant population as a whole show a significant decline in this proportion over the five-year period. In contrast, only approximately one-fifth of migrant owner occupiers had an income of less than £15,000 in 2006 and this proportion fell to 6 per cent in 2011. This is in marked contrast to figures for owner occupiers as a whole where around two-fifths had incomes of less than £15,000 in 2006, a proportion that fell to only 35 per cent in 2011. These income figures are essentially reinforced by data relating to employment status which show that both in 2006 and 2011 a much higher proportion of migrant owner occupiers were employed compared to migrant private tenants.

Finally, the chapter examined a number of aspects of housing quality that once again provided evidence that the age profile of the dwellings occupied by migrant private tenants was significantly and consistently older than the age profile of the homes of 'movers' in the owner-occupied sector. At the other end of the scale, the proportion of migrant private tenants living in homes built after 2000 is consistently, for each of the three consecutive surveys (2006, 2009 and 2011), much lower than the percentage of migrant owner occupiers. In contrast, similar proportions of all owner-occupiers and all private tenants occupy post-2000 dwellings suggesting that for 'mover' households modernity as an element of housing quality is a much more important factor driving migratory choices for owner-occupiers than for private tenants.

The Decent Home Standard measures housing quality in terms of a combination of dwelling characteristics and condition. It therefore provides a good basis for comparative analysis of the dwellings of owner occupiers and private tenants. Data for 2006 indicate a significant difference in the quality of homes occupied by migrant households in the owner-occupied and private rented sectors, with a much bigger proportion of the homes of migrant private tenants failing to attain the Decent Homes Standard. In contrast the figures for **all** owner occupiers and tenants show no such difference suggesting that prior to the housing market crash housing quality was a more important element in the migratory decisions of owner occupiers than private tenants. By 2011 the picture appears to have changed dramatically with very few cases of migrants in either the owner-occupied or privately rented sectors occupying homes that failed to reach the Decent Homes Standard, in contrast to figures for all households which indicated significant failure rates for both tenures. Once again this is suggestive of the importance of housing quality in the decisions of households to move – but in contrast to 2006 this appears to be equally applicable to migrants in the private rented sector as well. Data on the energy efficiency (SAP rating) of dwellings occupied by migrant owner occupiers and private tenants provide a similar picture of significant improvements in the case of both tenures, but in contrast to the Decent Homes Standard data there was by 2011 still a considerable inter-tenure difference.

Finally, the chapter examined differences in the capital values of the homes of migrant owner occupiers and migrant private tenants. Once again, the data revealed significant differences in the medians and upper and lower quartile figures for both 2006 and 2011 together with evidence that these differences had increased between 2006 and 2011.

Overall, therefore, this chapter's analysis of an array of essentially descriptive statistics related to key factors influencing a households' decision to move house suggests that there are valid grounds for postulating that the motivations and migratory patterns of owner-occupiers and private tenants may be sufficiently distinct to warrant a somewhat different theoretical and geographical framework for the analysis of local housing markets and submarkets. The next chapter, using a combination of inferential statistics and more qualitative data will delve more deeply into these motivations and migratory patterns.

Chapter 6 Tenure-based Housing Market Areas: Theory and Evidence

6.1 Introduction

The previous chapter was the first of three analytical chapters designed to address Objectives 3 to 5 of the thesis and the research proposition that emerged from the literature review (Chapter 2). It began by examining the underlying drivers of the rapid growth of the private rented sector in Northern Ireland in the first decade of the new millennium. However, the primary focus of Chapter 5 was to set out the results of the secondary analyses of key variables from three consecutive House Condition Surveys (2006, 2009 and 2011) and by doing so begin to build an evidence base to address the proposition that guides this study, namely that the current theoretical framework underpinning housing market analysis: ***"needs to reflect any tenure-related differences in the patterns and purpose of household migration".***

The main thrust of this theoretical framework set out in Chapter 2 can be briefly summarised as follows: housing market analysis underpinning estimates of future housing requirements should ideally be undertaken on the basis of a spatial framework of HMAs and submarkets that is functionally defined rather than on the basis of administrative boundaries; a key diagnostic characteristic of HMAs is the preponderance of internal spatial arbitrage within individual HMAs and the absence of spatial arbitrage between them; migration across HMA boundaries tends to be the result of changes in employment or life cycle changes (e.g. retirement); submarkets within HMAs arise because the process of spatial arbitrage is restricted by market imperfections; household migration across submarket boundaries is therefore likely to arise due to the unavailability of a suitable property in the submarket where the household is currently living; there is a tendency for those moving within a submarket to trade up, in contrast to households moving across submarkets, who tend to be trading down.

The descriptive statistics that emerged from the analysis in Chapter 5 indicated that there were clear differences between the housing circumstances and the demographic and socio-economic profiles of migrant households in the owner-

occupied and private rented sectors, suggesting the likelihood of significant differences in migratory patterns and motivations. Chapter 6 focuses on an analysis of these migratory patterns and in doing so specifically addresses Objective 4 by examining the *extent to which the theory underpinning the definition and delineation of functional housing markets is supported by the evidence* emerging from the three House Condition Surveys. Administrative and functional boundaries are used as the basis for comparing the migratory patterns of owner-occupiers and private tenants. The concepts of spatial arbitrage and substitutability together with evidence on trading up or down are explored with the help of qualitative data provided by migrant households who participated in the surveys – specifically on their reasons for moving house.

Chapter 6, therefore, is critical to the arguments developed in the thesis. Using a combination of quantitative and some more qualitative analysis it builds upon the descriptive statistics contained in Chapter 5 by using statistical significance tests to assess the degree to which the migratory patterns and motivations of private tenants differ from those of owner-occupiers and the reasons for this. This chapter provides the foundations for both the aggregated analysis undertaken in Chapter 7 and the final chapter setting out the overall conclusions and implications for policy and practice (Figure 6.1).

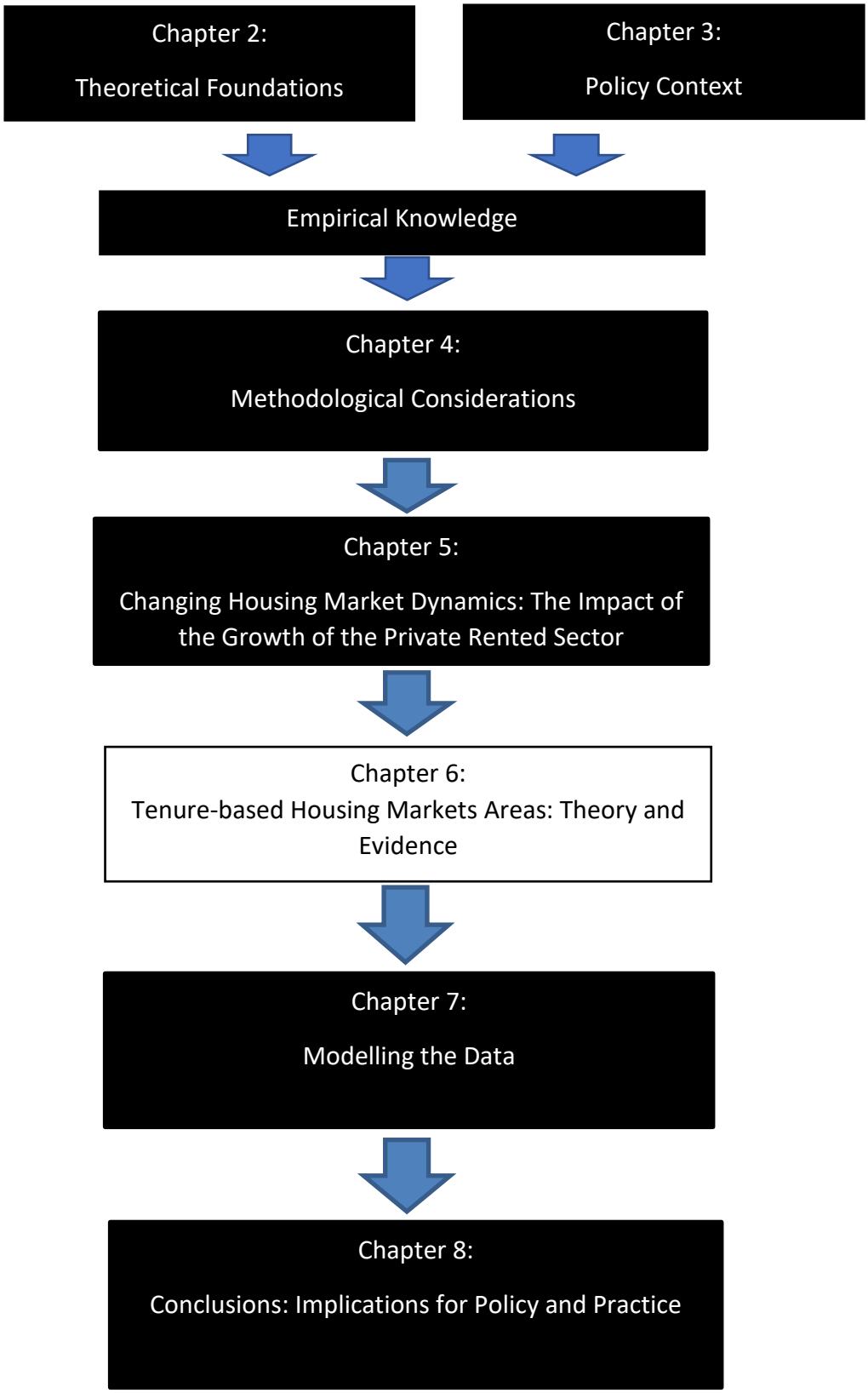


Figure 6-1: Chapter 6 in its structural context

6.2 Northern Ireland: The Spatial Framework for Analysis

Chapter 3 (section 3.5) noted that in 2007, in the context of a growing awareness of theoretical developments in Great Britain and the concomitant transition from housing needs assessment to housing market analysis, the Housing Executive commissioned a study which would provide a functionally based spatial framework for analysis of, and strategic intervention in, the housing market. The study's final report defined 11 housing markets for Northern Ireland, primarily on the basis of a number of key datasets: ONS Travel to Work Area (TTWA) boundaries, 2001 Census-based household migration statistics and Central Health Index (General Practitioner Registration) data for 2004-2007 (Young *et al.*, 2010).

The methodology (set out in more detail in section 3.5.2) adopted the 2001 TTWAs as a starting point and measured their degree of migration self-containment using 2001 census data. The initial boundaries derived from these two sources were subsequently amended in the light of migration flows based on an analysis of Central Health Index data and to take account of qualitative data that emerged from focus groups with key stakeholders. A threshold of 67 per cent for (origin-based and destination-based) self-containment was used as the basis for determining whether the TTWA was suitable for use as an HMA and amended to include adjacent local areas where migration flows between the two areas was greater than the 10 per cent threshold (20 per cent in the case of Belfast).

Figure 6.2 shows the final HMA boundaries and their relationship both to TTWAs and the administrative boundaries of the local government districts (LGDs) that were in existence prior to local government re-organisation in 2015. Not surprisingly, the geographical framework was dominated by the Belfast HMA. Young *et al.* (2010) noted how it had expanded since 2001 into adjacent TTWAs and now encompassed almost all of the nine LGDs surrounding Belfast as well as significant proportions of three others: Ballymena, Craigavon and Banbridge. Adjacent to the Belfast HMA, there were two distinctive HMAs to the south, one (Craigavon HMA) that included most of Craigavon LGD and all of Armagh LGD, the other (Newry HMA) centred on the city of Newry. To the north lay the Ballymena HMA (comprising a substantial part of Ballymena LGD) and the Coleraine HMA – incorporating most of the three LGDs on

the north coast. West of Lough Neagh, the six HMAs (Derry, Dungannon, Fermanagh, Mid-Ulster, Omagh and Strabane) were to a considerable degree coterminous with both LGD and TTWA boundaries, reflecting the dominant role of their district towns (or city in the case of Derry/Londonderry) vis-à-vis their more rural hinterlands.

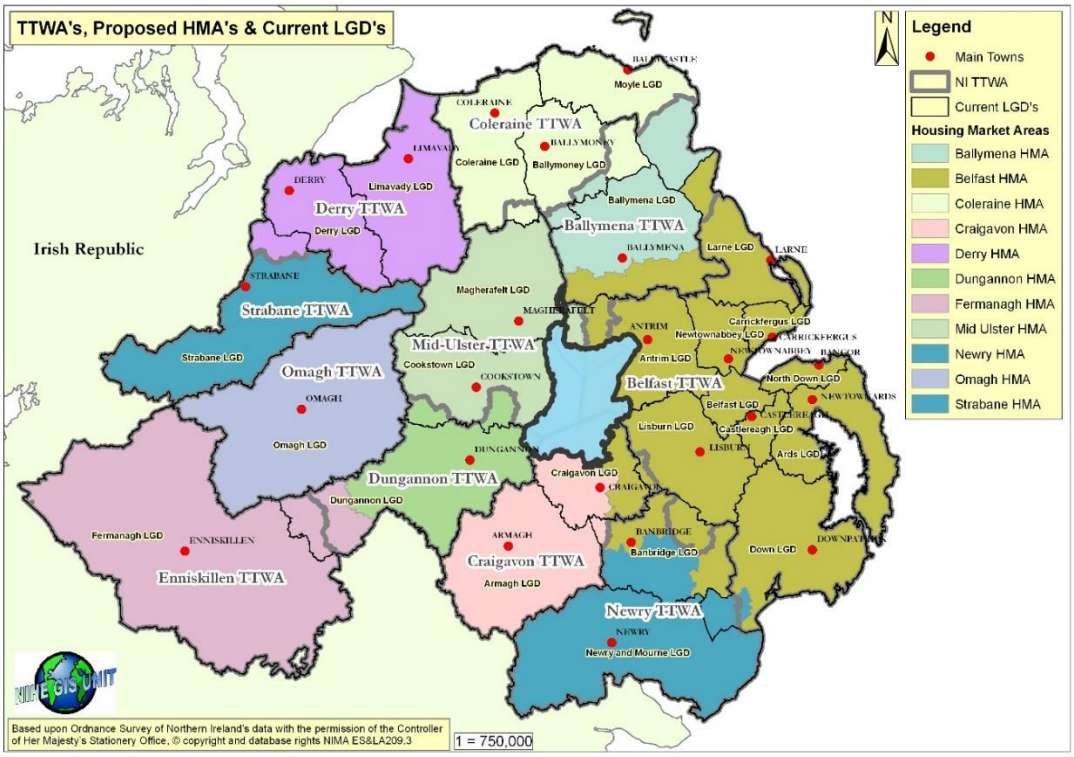


Figure 6-2: Northern Ireland TTWAs, HMAs and current (pre-2015) LGDs

Source: Young *et al.*, 2010

To date, submarkets have not yet been defined for the whole of Northern Ireland. For the purposes of this thesis, therefore, it was decided to focus on the Belfast Metropolitan HMA, for which O'Sullivan *et al.* (2012) had developed a submarket framework that divided this HMA into seven contiguous areas. The study noted that at that time the Belfast Metropolitan HMA included 384,500 households, and more than half of Northern Ireland's population and labour force, reflecting its dominant economic role in the context of Northern Ireland and the high levels of investment in its infrastructure since the signing of the peace 'Agreement' in 1998.

Section 3.5.3 of this thesis outlined the methodological approach used to delineate the seven submarkets based on the "degree of connectivity between different urban areas, settlements and rural localities within the Belfast Metropolitan HMA"

(O'Sullivan *et al*., 2011:17). Figure 6.3 shows these seven areas and their relationship to the (at that time proposed) new LGDs. The Greater Belfast submarket provides the urban concentration at the heart of the Belfast Metropolitan HMA. To the west lies the Lisburn submarket, dominated by the City of Lisburn, to the north-west the South Antrim submarket, comprising the town of Antrim and its mainly rural hinterland; to the north the East Antrim submarket, encompassing the former LGDs of Carrickfergus and Larne, to the east the North Down submarket centred on the seaside town Bangor; to the south-east the predominantly rural Ards Peninsula submarket; and, finally to the south, the Down submarket, once again a predominantly rural submarket. Further details on these submarkets are contained in Appendix 2.

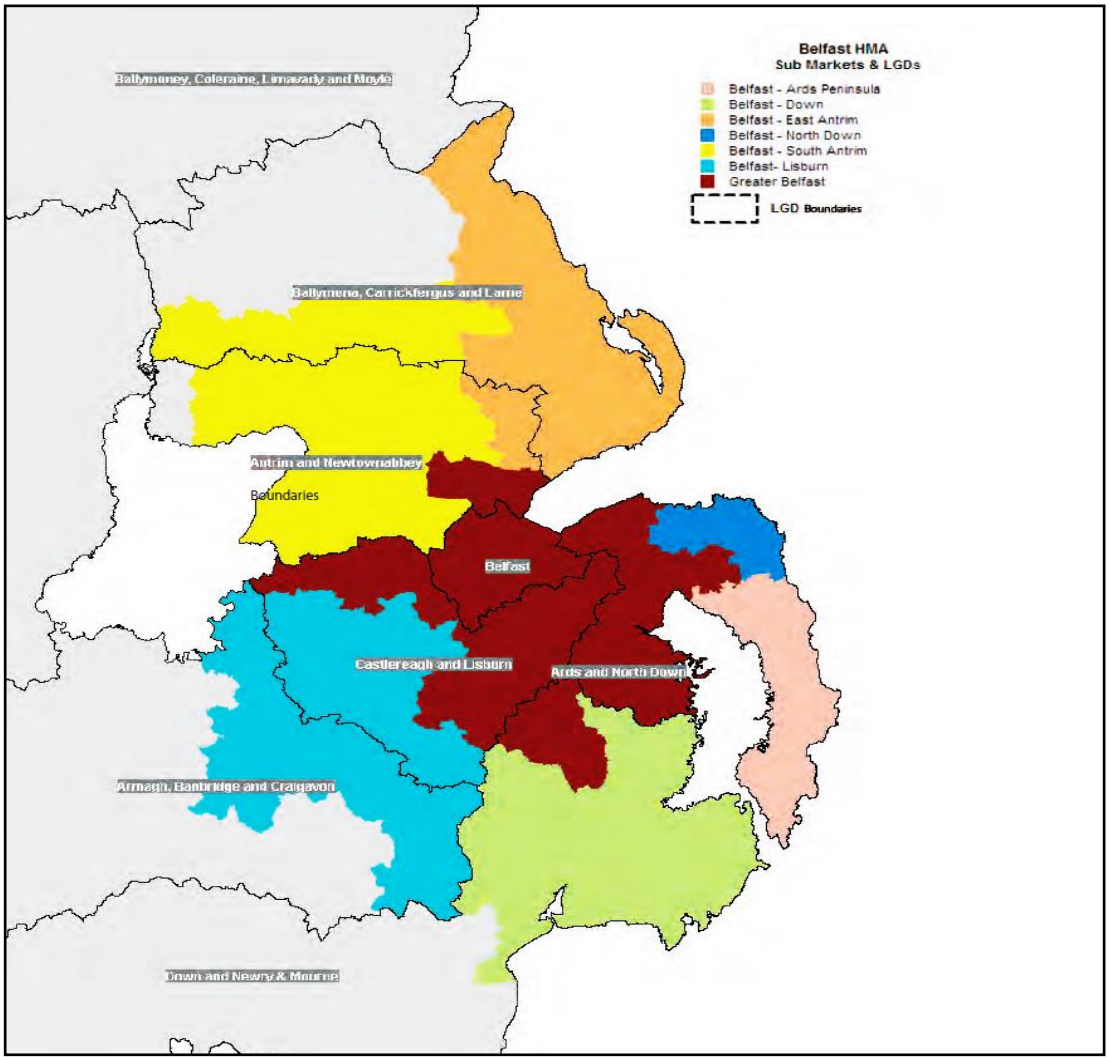


Figure 6-3: Belfast metropolitan HMA submarkets and (post 2015) LGD boundaries

Source: O'Sullivan *et al*., 2011

6.3 The Datasets Re-examined

Chapter 4 of this thesis included an overview of the three NIHCS datasets (2006, 2009 and 2011) that provide the main evidence base for meeting its research objectives and addressing the research proposition that lies at the heart of the study. The chapter outlined the sampling strategy and highlighted the quality assurance and weighting and grossing procedures that ensured robust statistics were available at the appropriate level of disaggregation. Furthermore, it also set out the key NIHCS variables that would provide the basis for comparing and contrasting the socio-economic, demographic and housing profiles of migrant households in the owner-occupied and private rented sectors discussed in Chapter 5. Accordingly, this section examines the three NIHCS datasets in more detail, explains how the analytical potential of these datasets is enhanced through additional data. It also sets out how the data is used in a way that reflects sample size and the modification of the methodological approach to reflect a more qualitative approach.

Data was collected on a total of 551 migrant households: 326 in 2006, 125 in 2009 and 100 in 2011. Overall, 143 of these were in the social sector and were therefore excluded from the analysis leaving a combined total of 115 in the owner-occupied sector and 294 in the private rented sector. Although the three datasets were largely similar in terms of the data collected, they varied in a small number of aspects. The two most important of these were as follows: firstly, the 2009 and 2011 datasets included information on the reasons for moving, whereas this was not collected as part of the 2006 survey; secondly, the 2011 dataset provided the address of the households' previous home, as did the 2006 dataset, but this key piece of information was absent from the 2009 dataset. These differences are reflected in the analysis contained in subsequent sections of this chapter.

Given that the focus of the research is on the delineation of functional housing market geographies in Northern Ireland the analysis examines only the migration patterns of internal migrants. Migrant households who had come to Northern Ireland from Britain, the Republic of Ireland, continental Europe or further afield all had to be excluded from this stage of the analysis. These exclusions, together with the absence of a previous (origin) address for migrants in the 2009 dataset, means that

most of the analysis in this chapter is based on a combined 2006/2011 dataset of 262 internal migrants in the private sector (91 owner occupiers and 171 tenants in the private rented sector) for which origin and destination addresses were available.

In the case of these internal migrants too, a small number of them refused to provide an exact address. For certain specific parts of the analysis, therefore, these cases had to be excluded. When examining the issue of spatial arbitrage and trading up and down it is also important that tenure remains constant. The analysis in relation to this issue therefore focuses on cases where the tenure of the dwelling occupied by the migrant households before and after moving remained constant.

The key House Condition Survey variables used in the study were set out in Chapter 4 (section 4.6). However, a number of key supplementary variables were added in to further enrich the analysis.

Firstly, the distance in miles between the origin (previous) and destination (current) addresses of all internal migrant households was incorporated, based on Google Maps road distances for all 262 valid cases in the combined 2006/2011 dataset. Distances were rounded to the nearest whole number[43] with the exception of distances of less than one mile, which were all rounded to 0.5. The distance-related data were also subsequently divided into five groups in order to provide a suitable categorical variable for the purpose of carrying out further analysis. However, given that the distribution of the data is highly positively skewed (see section 6.4), with more than a quarter of all migrant households moving less than 1 mile, the use of actual quintiles was inappropriate. The five categories were therefore chosen to provide a more meaningful analysis based on distances that approximately reflect the hierarchical geography associated with housing market analysis in the context of Northern Ireland. These are as follows: very short (<1 mile) – intra-neighbourhood moves; short (1.0-3.4 miles) – moves within small submarkets; medium (3.5-10.4 miles) – moves within larger submarkets; long (10.5-20.4 miles) – moves that crossed

[43] Google Maps distances of 1.5, 2.5, 3.5, 4.5, etc. miles were rounded to the nearest even whole number in order to ensure the mean was not inflated.

submarket boundaries, but would normally be within an HMA; very long (>20.4 miles) – moves that would normally cross HMA boundaries.

Secondly, three additional data items in the form of dummy variables were added that indicated whether a migrant household had crossed an LGD or HMA boundary or, in the case of the Belfast HMA, a submarket boundary.

Thirdly, data on capital value obtained from the Land and Property Service (LPSNI) website[44] was gathered on an individual basis for each of the 262 properties for which an exact address of the previous home (origin address) was available, as well as the size (m^2)[45] of both the origin and destination properties in order to address the issue of trading up or down.

Later sections of the chapter drill down into the data via a number of NIHCS variables such as those relating to the socio-demographic profile and employment status of the households in order to ascertain the extent to which they influence migratory patterns, as well, of course, as exploring the reasons for migration. The focus is on those migrant households in the owner-occupied and private rented sectors who have crossed HMA and or submarket boundaries.

6.4 Household Migration Patterns – Distance Travelled

Given that the focus of the study is on the delineation of functional housing market area boundaries and that these are ultimately determined by household migration patterns, distance travelled is a key indicator. Table 6.1 based on the combined 2006/2011 dataset, provides some preliminary comparative insights into the distances travelled by **internal** migrant households in both the owner-occupied and private rented sectors. The results show that on average owner occupiers (n=91) travelled approximately 10.15 miles compared to private tenants (n=171), who travelled an average distance of only 6.72 miles –approximately one third lower[46].

[44] https://lpsni.gov.uk/vListDCV/search.asp?submit=form

[45] The possibility that a dwelling had been extended since the actual survey was carried out was borne in mind. However, a quality assurance check of the 100 dwellings from the 2011 NIHCS dataset that had capital value recorded at the time of survey showed that the valuation had only increased in three cases. On this basis the issue was considered to have a minimal impact on the overall findings.

[46] The standard error for each of these means is 1.98 for owner occupiers compared to 1.05 for private tenants – reflecting the much larger number of private tenants in the overall sample.

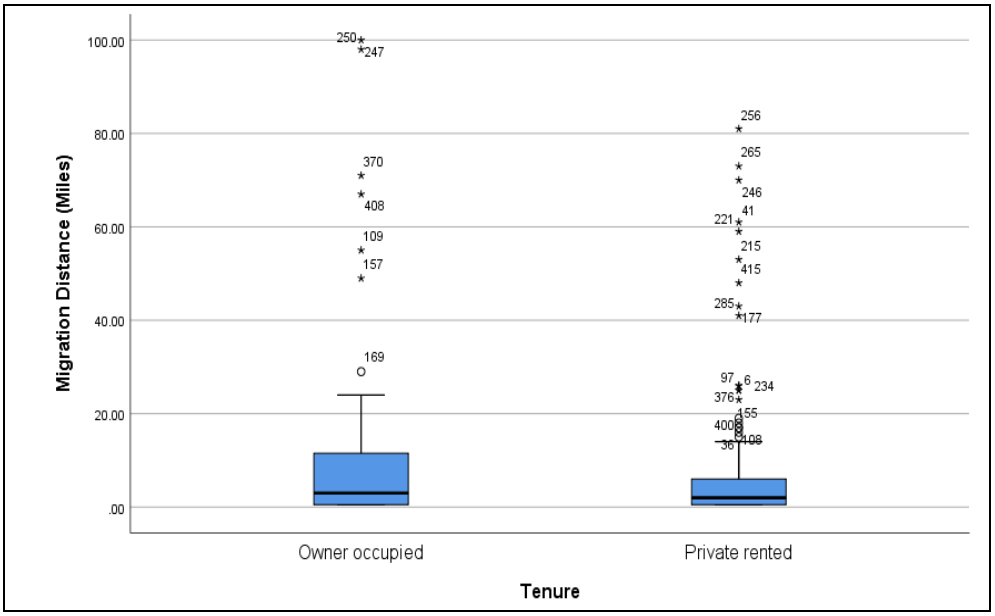
Likewise, the trimmed means (5%) that are calculated on the basis of excluding the more extreme outliers also show a clear differential between the typical distance travelled by migrating owner occupiers (6.78) and private tenants (4.12), a differential that is likewise reflected in the median values: 3 miles for owner occupiers and 2 miles for private tenants.

Table 6-1: Migrant households: Distance travelled by tenure, 2006/11

Key Parameters	**Owner Occupiers**	**Private Tenants**
Mean (Std Error)	10.15 (1.98)	6.72 (1.05)
5% Trimmed mean	6.78	4.12
Median	3.00	2.00
Variance	356.66	189.68
Std Deviation	18.89	13.77
Range	99.50	80.50
Interquartile range	11.50	5.50
Skewness (Std Error)	3.27 (.253)	3.49 (.186)

Source: NIHCS combined 2006/2011 dataset, n = 262

However, it is also important to examine the distribution of the data. The comparative boxplot shown in Figure 6.3 demonstrates graphically the contrasting data distributions for migrant owner occupiers and private tenants. It clearly shows the high concentration of values at the lower end of the distance spectrum in the case of both tenures, but also the much smaller interquartile range (5.50) in the private rented sector compared to the owner-occupied sector (11.50). Both sectors also display a highly skewed distribution, but one that is more so in the case of the private rented sector (skewness = 3.491 for private tenants and 3.276 for owner occupiers).



Source: NIHCS combined 2006/2011 dataset, n = 262

Figure 6-4: Migrant households: Distance travelled by tenure, 2006/11: Boxplot

Before moving to a more detailed examination of the inter-tenure statistical differences and given the turbulence experienced in Northern Ireland's housing market in the period 2006-2011, it was also considered appropriate to undertake a brief analysis of the data on migration distance separately for 2006 and 2011. Table 6.2 summarises key figures from this analysis and indicates that despite changing housing market conditions between 2006 and 2011, the results for each of these years are not dissimilar to those for the combined 2006/2011 dataset – particularly in relation to the difference in the typical distances travelled by private tenants and owner occupiers. Although the difference between the two tenures in 2011 appear to be somewhat starker, caution must be exercised given the much smaller number of cases in the owner-occupied sector on which these figures are based.

Table 6-2: Migrant households: Distance travelled by tenure, 2006, 2011, 2006/11

	2006		**2011**		**2006/2011**	
	OOccs	PTens	OOccs	PTens	OOccs	PTens
Mean	9.35	7.43	14.20	5.01	10.15	6.72
Median	2.5	1.50	6.00	2.00	3.00	2.00
IQ range	10.00	5.50	11.50	4.50	11.50	5.50
Skewness	3.73	3.23	2.13	3.56	3.28	3.49

Source: NIHCS combined 2006/2011 dataset, n = 262

It is also apparent from Table 6.1 that there are considerable inter-tenure differences with regard to the standard deviation of the two subsamples. The higher value for owner occupiers (18.89) compared to the value for private tenants (13.77), reflects the greater mobility of the former and suggests more restricted housing choices for the latter. However, using the *t*-test for examining the level of statistical significance, the analysis indicates that the value of *t* (1.533) is not significant at the 0.05 level (*p* = .128), suggesting that while the distributions of the two tenure-based subsamples are characterised by differences in terms of measures of central tendency, these differences are not sufficient to pass the test of rigorous statistical investigation.

Field (2013), however, points out that because the t-statistic is not statistically significant need not necessarily imply that an effect (in this case the impact of tenure on migration distance) is of no practical importance. Whether this effect is 'substantive' can be estimated on the basis of an r-value[47]. However, the resultant r-value of 0.128 indicates that despite what appears to be a considerable difference in the average distances travelled by owner occupiers and private tenants, the tenure of migrant households has only a very small effect on the distance travelled.

Distance *per se*, however, must be regarded as a somewhat crude indicator of migration patterns in the context of a functional housing market geography. In order to explore this issue in a more meaningful manner, analysis of the 2006/2011 HCS data (Table 6.3) was undertaken on the basis of the distance classifications set out in Section 6.3.

[47] using the following formula:

$$r = \sqrt{\frac{t^2}{t^2 + df}} \; where \; r = \sqrt{\frac{1.533^2}{1.533^2 + 42.124}} = 0.128$$

Table 6-3: Migrant households: Categorical distances by tenure, 2006/11: Numbers and percentages

	V. Short (%)	Short (%)	Medium (%)	Long (%)	V. Long (%)	Total (%)
OOccs	24 (26)	25 (28)	18 (20)	12 (13)	12 (13)	91 (100)
PTens	69 (40)	43 (25)	33 (19)	12 (7)	14 (8)	171 (100)
Total	92 (38)	68 (24)	51 (18)	25 (8)	26 (13)	262 (100)

Source: NIHCS combined 2006/2011 dataset, n = 262

Given the large difference in the overall number of migrant owner occupiers and private tenants in the dataset, the analysis focused on proportional differences. It again shows that tenants in the private rented sector tend to move shorter distances than owner occupiers with 40 per cent of all journeys by private tenants migrating less than one mile ('very short') compared to approximately one quarter (26%) of those undertaken by owner occupiers. Conversely, in the 'long' and very long' distance categories the proportions for owner occupiers were 6 percentage points and 5 percentage points higher respectively than for private tenants.

In order to assess the statistical significance of these differences the data was analysed using a Chi-Square test. Table 6.4 shows that there are larger inter-tenure differences (between observed and expected counts) for the very short, long and very long distance categories, suggesting that a correlation may exist between tenure and distance travelled. However, the Pearson Chi-Square value (χ^2) of 7.364 (with 4 degrees of freedom) and associated significance value (p) of .118[48], indicates that the relationship between tenure and categorised distance travelled is not statistically significant at the p = 0.05 level. The associated Cramer's V statistic (φ) of .168 does indicate that there is some association, but that this can only be viewed as a weak one. Despite the weak association, the results do suggest that a more nuanced analysis based on whether 'boundaries' are crossed could provide more meaningful insights, as it is this issue that goes to the heart of the conceptual validity underpinning the delineation of HMAS and submarkets. This issue is explored in the next section by means of a more detailed analysis of migration patterns across administrative (LGD), HMA and submarket boundaries.

[48] 0 cells had an expected count of less than 5 and the minimum expected count was 8.34.

Table 6-4: Migrant households: Categorical distances by tenure 2006/11: observed and expected counts

Distance Category	Observed/Expected	Owner Occupied	Privately Rented	Total
Very short	Count	24.0	69.0	93.0
	Expected Count	32.3	60.7	93.0
Short	Count	25.0	43.0	68.0
	Expected Count	23.6	44.4	68.0
Medium	Count	18.0	33.0	51.0
	Expected Count	17.7	33.3	51.0
Long	Count	12.0	12.0	24.0
	Expected Count	8.3	15.7	24.0
Very Long	Count	12.0	14.0	26.0
	Expected Count	9.0	17.0	26.0
Total	Count	91.0	171.0	262.0
	Expected Count	91.0	171.0	262.0

Source: NIHCS combined 2006/2011 dataset, n = 262

6.5 Household Migration Patterns – Crossing Boundaries

The conceptual framework underpinning the delineation of functional HMAs envisages that their boundaries should reflect the behaviour of households in the real world and therefore their actual interactions with the housing market rather than being constrained by any given administrative boundaries. These functional boundaries are established using agreed thresholds of migratory self-containment (Chapter 3, section 3.5.3). Migration crossing HMA boundaries tends to be associated with changes in employment or life cycle changes, for example, retirement.

Not unexpectedly, analysis of the combined 2006/2011 House Condition Survey datasets shows high levels of self-containment: only 12 per cent of migrant owner occupiers and 10 per cent of migrant private tenants crossed an HMA boundary. However, analysis on the basis of the 26 administrative (LGD) areas that existed at the time of the 2006 and 2011 House Condition Surveys shows that the propensity for migrant owner occupiers to travel further distances is reflected in the fact that a much higher proportion of owner occupiers crossed LGD boundaries. More than one third (35%) of all internal migrant households in the owner-occupied sector crossed

an LGD boundary compared to less than one fifth (19%) of those in the private rented sector.

An initial examination of the cross tabulation summarised in Table 6.5a shows that in relation to HMA boundaries there is little difference between the expected and observed counts. This is unsurprising for two reasons. Firstly, given the self-containment guidelines used to delineate Northern Ireland's HMA boundaries, few households would be expected to cross these boundaries regardless of whether they were owner occupiers or private tenants. Secondly, given that the dataset used to delineate these boundaries was dominated by owner-occupiers and that private tenants generally migrate shorter distances it would be even more unlikely that there would be any significant difference. This is borne out by the χ^2 value of .287 with an associated significance (*p*) value of .592 and φ value of .033.

Table 6-5a: Migrant households: HMA boundary crossed by tenure 2006/11 observed and expected counts

Boundary Group	Observed/Expected	Owner Occupied	Privately Rented	Total
Did not cross HMA Boundary	Count	80.0	154	234
	Expected Count	81.3	152.7	234.0
Crossed HMA Boundary	Count	11	17	28
	Expected Count	9.7	18.3	28.0
Total	Count	91	171	262
	Expected Count	91.0	171.0	262.0

Source: NIHCS combined 2006/2011 dataset, n = 262

However, the same statistical analysis carried out on the basis of the pre-2015 LGD boundaries that provide a much tighter geographical framework reveals a different picture. In contrast to the analysis for HMA boundaries crossed, Table 6.5b shows clear differences between the expected and observed counts. For this cross-tabulation χ^2 is significant at the 5% level (8.708, p = .003) and has an associated φ value of .182, indicating a small to modest effect size. It is important to stress, however, that this analysis does not indicate that the pre-2015 LGD boundaries are more meaningful for understanding the housing choices of private tenants, but

merely that their migratory patterns (and therefore, possibly the underlying dynamics and motivations) differ from those of owner-occupiers.

Table 6-5b: Migrant households: Pre-2015 LGD boundary crossed by tenure 2006/11: observed and expected counts

Boundary Group	Observed/Expected	Owner Occupied	Privately Rented	Total
Did not cross LGD Boundary	Count	59	139	198
	Expected Count	68.8	129.2	198.0
Crossed LGD Boundary	Count	32	32	64
	Expected Count	22.2	41.8	64.0
Total	Count	91	171	262
	Expected Count	91.0	171.0	262.0

Source: NIHCS combined 2006/2011 dataset, n = 262

The high level of self-containment with regard to HMA boundaries lends support to the theoretical position that functional HMAs provide a more meaningful framework for housing market analysis. However, given the differences in the demographic and socio-economic profiles of migrant owner-occupiers and private tenants (Chapter 5, section 5.3) the analysis of migratory patterns based on LGD boundaries suggests that there may be significant underlying inter-tenure differences in terms of the drivers and motivations for moving house.

Before exploring these in more detail, Tables 6.6a and 6.6b provide a more detailed analysis of migratory patterns in relation to HMA boundaries. They not only provide more geographically specific information on inter-tenure differences, but also suggest that although a similar proportion of owner occupiers (12%) and private tenants (10%) cross HMA boundaries, their migratory patterns are geographically very different. Although the actual number of cross-boundary migrants is small, the geographical patterns for owner occupiers and private tenants are discernibly different. In the case of private tenants, Belfast HMA is a *destination* location for 6 of the 17 cases and the origin of these 6 migrant households is from an HMA adjacent to Belfast. For owner occupiers, however, Belfast is primarily an *origin* location (for 6 migrant households, i.e. more than half of the cases) and the distances travelled by these six cases are much longer and to HMAs that are not contiguous with Belfast

HMA (three to Fermanagh, two to the North Coast and one to Omagh). The underlying reasons for this major difference will be explored as part of the more qualitative analysis undertaken later in the chapter (section 6.8), but the preliminary analysis already suggests inter-tenure differences in the underlying dynamics and motivations, and in particular the importance of the role played by life cycle events (Clark and Huang, 2003).

Table 6-6: Migrant owner occupiers and private tenants: Origin-destination analysis by HMA, 2006/11
(a) Owner occupiers

Destination HMA

HMA	B'mena	B'fast	C'raine	C'avon	Derry	D'gnn	Ferm	MidU	Newry	Omagh	Strab
B'mena	3	1									
B'fast		49	2				3			1	
C'raine	1		6								
C'avon				2					1		
Derry					8						
D'gnn						3					
Ferm							2				
MidU						1		2			
Newry									1		
Omagh								1		2	
Strab											2

Source: NIHCS combined 2006/2011 dataset, n = 91

(b) Private tenants

Destination HMA

	B'mena	B'fast	C'raine	C'avon	Derry	D'gnn	Ferm	MidU	Newry	Omagh	Strab
B'mena	10							1			
B'fast	2	59	2				2		1		
C'raine		1	14	1	1						
C'avon		1		18							
Derry					14						
D'gnn						6					
Ferm							7				
MidU		3	1					5			
Newry		1							8		
Omagh										7	
Strab											6

Source: NIHCS combined 2006/2011 dataset, n = 171

6.6 The Influence of Socio-demographic and Socio-economic Differences

Chapter 5, section 5.3 highlighted a number of important differences in the socio-demographic and socio-economic profiles of migrant owner-occupiers and private tenants. These differences emerged from an analysis of four key variables (age of household reference person [HRP], household composition, employment status of HRP and household income). This section harnesses these four variables in a series of more complex three-way cross-tabulations and associated inferential statistics to explore the impact of these differences on the migratory patterns of owner occupiers and private tenants with regard to HMA and LGD boundaries. In the case of each of these variables the analysis begins by examining the influence of the specific socio-demographic or socio-economic variable on categorised migration distance travelled by tenure.

6.6.1 Age of Household Reference Person (HRP)

A tenure-neutral cross-tabulation of age of HRP and categorised **migration distance** produces a Pearson Chi-Square value (χ^2) of 16.924, however this is statistically insignificant (p = .391). Nonetheless, when including tenure as a control variable within a three-way cross-tabulation, the analysis shows that for owner occupiers the corresponding figures show statistical significance, albeit at the 10% level (χ^2 = 19.575, p = .076), while for private tenants the equivalent figures remain statistically insignificant at any conventional level (χ^2 = 13.524, p =.634). While neither of these tenure-based figures are statistically significant on its own (p >.05), they would suggest that age of HRP ha a much more important influence on the migration patterns of owner occupiers than private tenants. This is substantiated by the difference in the Cramer's V value (φ) of .268 for owner occupiers (indicating a moderate relationship) and only .141 for private tenants thereby displaying a much weaker effect.

A further three-way cross-tabulation employing age of HRP as a control variable is undertaken to establish whether the age of HRP categories are important determinants of migration patterns. Table 6.7 summarises the key inferential statistics emerging from this more complex cross-tabulation and demonstrates that

although the correlation between age of HRP and migratory distance travelled by owner-occupiers and private tenants is not statistically significant at the 5% level, it is nevertheless important within the 40-59 age group, displaying significance at the 10% level and a moderate to strong effect (p = .064 and φ = .354). This finding is arguably reflective of the associated observed and expected counts table that exhibits a disproportionately high number of private tenants in this age group migrating only very short distances, whereas a disproportionately high number of owner occupiers migrate long and very long distances. In addition, Table 6.7 also provides an indication of inter-tenure differences in relation to the 17-24 age group, although these appear to be less significant than for the 40-59 age group (χ^2 = .188 and φ = .347).

Table 6-7: Migration distance (categorised) and tenure by age of HRP: Inferential statistics

Age Group	**N of Valid Cases**	**Chi-Square Value**	**Degrees of Freedom**	**Asymptotic Significance**	**Cramer's V Value**
17-24	51	6.155	4	.188	.347
25-39	120	4.676	4	.322	.197
40-59	71	8.894	4	.064	.354
60-74	17	2.426	4	.658	.378
75 plus*	3				
Overall	262	7.364	4	.118	.168

*No inferential statistics are calculated because tenure is constant

Source: NIHCS combined 2006/2011 dataset, n = 262

A tenure-neutral cross-tabulation of age of HRP encompassing a binary variable which indicates whether an **HMA boundary** is crossed gives a χ^2 value of 6.267 and associated p-value of .180, somewhat beyond the 5% level of significance. For owner occupiers the corresponding figures display a χ^2 value of 3.839 which is also statistically insignificant (p = .279), while for private tenants the equivalent figures are χ^2 = 7.540 and p = .110. Again, although these tenure-based values are not statistically significant, they suggest that in contrast to distance travelled, there was a stronger association between age of HRP and whether an HMA boundary is crossed for private tenants than for owner occupiers. However, the φ value of .205 for owner

occupiers and .210 for private tenants indicate that there is only a small to moderate effect size for both tenures.

Table 6.8 sets out the key inferential statistics emerging from a three-way cross-tabulation with age of HRP as the control variable and reflects the observations set out and explained in section 6.5. The methodological approach for determining HMA boundaries and the tendency for private tenants to travel shorter distances means that although age of HRP appears to be of some importance as a factor in determining generally whether a migrant household crosses an HMA boundary, it is of very limited relevance in explaining the minor inter-tenure differences in the migratory patterns of households categorised by age. As evidenced, the inferential statistics for the 17-24 age group (χ^2 = 1.739, p = .187 and $\varphi = .185$), the age group that tends to show the most divergence by tenure, indicates only a weak association.

Table 6-8: Crossed HMA boundary and tenure by age of HRP: Inferential statistics

Age Group	**N of Valid Cases**	**Chi-Square Value**	**Degrees of Freedom**	**Asymptotic Significance**	**Cramer's V Value**
17-24	51	1.739	1	.187	.185
25-39	120	1.403	1	.236	.108
40-59	71	1.274	1	.259	.134
60-74	17	.944	1	.331	.236
75 plus*	3				
Overall	262	.287	1	.592	.033

*No inferential statistics are calculated because tenure is constant

Source: NIHCS combined 2006/2011 dataset, n = 262

A different picture however emerges when performing the analysis on the basis of **LGD boundaries**. The initial tenure-neutral cross-tabulation of age of HRP and whether a migrant household crosses an LGD boundary indicates that there is effectively no association evident (χ^2 = 1.463 p = .833). The equivalent figures for owner occupiers (χ^2 =2.391, p = .495) and private tenants (χ^2 =2.700, p = .609) reveals no significance. Similarly, the corresponding φ values are .162 and .126 respectively, indicating a relatively weak effect. Taken together with the significance values they indicate that age of HRP is of somewhat more importance as a factor for owner occupiers – the reverse of what emerged from the analysis of age of HRP and HMA

boundaries. However, a more detailed analysis of this three-way relationship using age of HRP as the control variable as opposed to tenure confirms that age of HRP is of importance in determining the propensity of owner occupiers and private tenants to cross an LGD boundary. As observed in Table 6.9, the lack of association in the case of the 17-24 age group (χ^2 = .061, p = .804; φ value of .035) contrasts starkly with the 25-39 age category where there is clear evidence of an association (χ^2 = 4.958, p = .026; φ = .203). The associated expected and observed counts cross-tabulation shows that private tenants in the 25-39 age group are much less likely to cross LGD boundaries than owner occupiers, in contrast to the 17-24 age group where expected and observed counts are almost exactly the same. Again, this LGD-based analysis provides further evidence that migration patterns and underlying dynamics are different for private tenants and owner occupiers. It is already possible at this stage to speculate about the reasons for these differences in terms, but further analysis of migratory patterns in relation to household composition, and then socio-economic indicators will provide a firmer evidence base for interpretation.

Table 6-9: Crossed LGD boundary by tenure by age of HRP: Inferential statistics

Age Group	N of Valid Cases	Chi-Square Value	Degrees of Freedom	Asymptotic Significance	Cramer's V Value
17-24	51	.061	1	.804	.035
25-39	120	4.958	1	.026	.203
40-59	71	3.492	1	.062	.222
60-74	17	3.438	1	.064	.450
75 plus*	3				
Overall	262	8.708	1	.003	.182

*No inferential statistics are calculated because tenure is constant

Source: NIHCS combined 2006/2011 dataset, n = 262

6.6.2 Household Composition

Household composition (household type) is closely associated with life-cycle changes and is therefore a key factor in housing choice. There is obviously also a well-recognised relationship between household composition and age of HRP – a dynamic also evident within this migrant household analysis. Examination of household composition and age reveals a strong statistically significant association (χ^2 =

318.544, p = .000; φ = .503). The more focussed analysis in this section reflects this strong inter-relationship, however, it also recognises the fact that there are eight household types, which, given the size of the subsamples involved, means that achieving statistical significance is more difficult than in the case of the five-way categorisation of age of HRP.

Indeed, a tenure-neutral cross-tabulation of household type and **migration distance** divided into five categories reveals little indication of an association between the two factors (χ^2 = 29.240, p = .400). However, a three-way cross-tabulation incorporating tenure as a control variable again indicates a major inter-tenure difference, with owner occupiers only marginally outside the 10% level of significance (χ^2 =36.201, p =.138), whereas private tenants demonstrate no tendency at all (χ^2 =22.281, p = .768). As with age of HRP, therefore, the analysis suggests that household composition is a much more contributory factor in determining distance travelled for owner occupiers than for private tenants – though not statistically significant (p > 0.05). Again, this is reinforced by the difference in the φ value of .315 for owner occupiers which indicates a stronger association than for private tenants (φ =.180), which displays a much weaker effect.

Further cross-tabulation between these three variables applying household composition as the control variable provides an indication of which of the household composition categories are of most importance in influencing migration patterns. The results reveal a χ^2 value of 7.364 with a p value of .118, indicating the absence of an overall statistically significant relationship. However, in the case of lone adults, who account for almost one third of all migrant households, the findings exhibit a statistically significant association between household type and the typical distances travelled by owner occupiers and private tenants. (χ^2 = 9.818, p = .044). Interestingly, the observed and expected counts indicate that lone adults in the private rented sector are disproportionately inclined to travel very short distances, while conversely, lone adult owner occupiers are disproportionately underrepresented in the very short category. The φ value of .350 indicates a strong effect size. There is no statistically significant relationship apparent for any other of the remaining seven

household composition categories[49]. In the case of lone older households, the equivalent figures cannot be considered as meaningful given the very small sample size (n=9) (χ^2 = 9.000, p = .061; φ value of 1.000).

A tenure-neutral analysis of household type and whether an **HMA boundary** is crossed indicates a statistically significant association (χ^2 = 16.319, p = .022) and a moderate size effect (φ = .250). However, when this analysis is refined by the addition of tenure as a control variable the smaller subsample sizes mean that the significance values for neither owner occupiers (.094) nor private tenants (.268) are sufficient to indicate statistical significance at the 5% level. Nevertheless, they do signal a considerable inter-tenure difference and a φ value of .366 in the case of owner occupiers suggests that there is still a moderate to strong size effect for this tenure (compared to only .227 for private tenants).

However, the inferential statistics emerging from a three-way cross-tabulation with household composition as the control variable show little evidence of association. Large adult households have the lowest *p* value of all eight groups (.208). The associated φ value of .366 indicates that there may well be a relationship of some importance, but caution is required as these inferential statistics are based on a subsample of 17. Conversely, for lone adults (where the sub sample size is 80) the *p* value is .865 (φ = 0.19), indicating that being a lone adult migrant household has little or no bearing on inter-tenure migration patterns in relation to HMA boundaries.

Analysis undertaken on the basis of **LGD boundaries** also suffers to a certain extent from the same problem of small subsamples. However, even with this proviso, as in the case of categorised distance, a very different picture emerges. The initial tenure-neutral cross-tabulation of household composition and whether a migrant household crosses an LGD boundary infers that there is little or no association between these two variables (χ^2 = 2.915, *p* = .893) . However, when tenure is incorporated as a control variable, differences between owner occupiers (χ^2 = 6.781, *p* = .452) and private tenants (χ^2 = 1.909, *p* = .965) become apparent, even if not statistically

[49] The remaining categories are: two adults, small family, large family, large adult, two older, lone older, lone parent.

significant. The corresponding φ values of .273 and .106 respectively reinforce these inter-tenure differences and suggest that, as in the case of age of HRP, household type is generally of more importance as a factor in the case of owner occupiers.

As observed in Table 6.10, this three-way relationship, where household type is applied as the control variable rather than tenure, indicates that household composition is of importance in determining the propensity of owner occupiers and private tenants to cross an LGD boundary (p = .003). This is particularly apparent in the case of lone adults where there is a statistically significant relationship with a moderate to strong effect (χ^2 = 6.938, p = .008; φ value of .294).

Table 6-10: Crossed LGD boundary by tenure by household type: Inferential statistics

Household Type	N of Valid Cases	Chi-Square Value	Degrees of Freedom	Asymptotic Significance	Cramer's V Value
Lone Adult	80	6.938	1	.008	.294
Two Adults	53	.687	1	.407	.114
Small Family	40	.901	1	.343	.150
Large Family	17	1.022	1	.312	.245
Large Adult	17	1.587	1	.208	.306
Two Older	7	2.100	1	.147	.548
Lone Older	9	2.250	1	.134	.500
Lone Parent	39	.328	1	.567	.092
Overall	262	8.708	1	.003	.182

Source: NIHCS combined 2006/2011 dataset, n = 262

The associated expected and observed count cross-tabulation shows that private tenants in the lone adult category are disproportionately much less likely to cross LGD boundaries than owner occupiers. This finding is in contrast to the analysis based on HMA boundaries that indicated household composition has no discernible impact on the migratory patterns of owner occupiers and private tenants at this larger scale, and reinforces the finding that private tenants tend to migrate shorter distances and provides further evidence that the dynamics underpinning the migratory patterns of lone adult migrant households in the private rented sector are different from lone migrant households in the owner occupied sector. Furthermore, this household type

is the only one for which inter-tenure differences in the propensity for households to cross LGD boundaries is important[50].

The results emerging from the analysis of migratory patterns of household types reinforces the previous analysis that emerged based on age of HRP and provide further support for the proposition that there may be significant inter-tenure differences in the underlying drivers and motivations for moving house that can be partially explained by socio-demographic factors. Accordingly, two socio-economic factors are examined in an attempt to provide more potential insights into these inter-relationships and inter-tenure contrasts.

6.6.3 Employment Status

As in the case of socio-demographic variables, the analysis begins with a tenure-neutral cross-tabulation of the key variables. In the case of employment status and **categorised distance** travelled, the analysis indicates that the dataset provides no substantial evidence of an association between the two variables (χ^2 = 19.808, p = .470; φ = .137). Indeed, the addition of tenure as a control variable only results in a marginal change to this picture. For owner occupiers the χ^2 value is 17.613 (p = .347), for private tenants it is 18.780 (p = .536).

However, an examination of a three-way cross-tabulation of the same variables, but with employment status as a control variable highlights a number of differences in terms of the impact of employment status on inter-tenure differences in migration distance (Table 6.11). At the overall level, employment status is marginally beyond statistical significance (p = .118) and reveals a relatively weak effect (φ = .168). This also appears to be the case for the remaining employment status categories, which show limited impact on inter-tenure differences in migration distance travelled[51] with the exception of being permanently sick or disabled. This employment status

[50] In the case of the lone older and two older categories, there appears to be a strong size effect (φ = .500 and .548), however it is important to stress that these statistics are based on very small sample sizes.

[51] Unfortunately, the analysis is somewhat distorted by the fact that the HRPs of 154 households out of a total of 262 are classified as 'working'.

does show a statistically significant effect (χ^2= 15.758, p = .003; φ = .778) – but is based on a relatively small sample size (26)[52].

Table 6-11: Categorised migration distance by tenure by employment status: Inferential statistics

Employment Status	N of Valid Cases	Chi-Square Value	Degrees of Freedom	Asymptotic Significance	Cramer's V Value
Working	154	4.089	4	.394	.163
Not Working	43	.968	4	.915	.150
Retired	16	1.584	4	.812	.315
Permanently Sick /Disabled	26	15.758	4	.003	.778
Looking after Family/Home	16	2.347	4	.672	.383
Other* (incl. Students)	7				
Overall	262	7.364	4	.118	.168

* No inferential statistics are calculated because tenure is constant.

Source: NIHCS combined 2006/2011 dataset, n = 262

A tenure-neutral analysis of employment status and whether an **HMA boundary** is crossed also indicates very little or no association (p = .937). This position remains essentially unchanged even when tenure is added to the cross-tabulation as a control variable – the χ^2 values have p values of .902 for owner occupiers and .962 for private tenants. This lack of association again reflects the basis for the HMA delineation and the fact that private tenants tend to migrate shorter distances. Indeed, the three-way cross-tabulation of the same three variables with employment status of HRP as the control variable does not present any further analytical insights (χ^2 = .287, p = .592).

However, a different picture emerges when the analysis is carried out on the basis of the much tighter spatial framework of **LGD boundaries**. The tenure neutral analysis of employment status and whether an LGD boundary is crossed signals a somewhat greater level of association (χ^2= 4.181, p = .524) than for HMA boundaries. The three-way cross-tabulation with tenure as the control variable also indicates that this is

[52] The majority of cell sizes contain less than 5 cases.

primarily due to the partial association apparent in the case of owner occupiers with a significance value of .206 compared to .875 for private tenants. Indeed, the three-way cross-tabulation with employment status used as the control variable provides a number of further insights (Table 6.12).

Table 6-12: Cross LGD boundary by tenure by employment status: Inferential statistics

Employment Status	**N of Valid Cases**	**Chi-Square Value**	**Degrees of Freedom**	**Asymptotic Significance**	**Cramer's V Value**
Working	154	4.863	1	.027	.178
Not Working	43	.479	1	.489	.106
Retired	16	6.112	1	.013	.618
Permanently Sick /Disabled	26	.009	1	.925	.018
Looking after Family/Home	16	.152	1	.696	.098
Other* (incl. Students)	7				
Overall	262	8.708	1	.003	.182

* No inferential statistics are calculated because tenure is constant

Source: NIHCS combined 2006/2011 dataset, n = 262

Overall, the analysis shows that there is a statistically significant association between employment status and the interaction of tenure (owner occupiers or private tenants) and the crossing of an LGD boundary (χ^2 = 8.708, p = .003). This appears largely due to the dominant influence of the 'working' category (χ^2 = 4.863, p = .027) and is reflective of the disproportionately higher number of working owner-occupiers crossing LGD boundaries. The relatively weak effect size for employment status 'working' (φ = .178) mirrors the effect size for the entire sample (.182) indicating that despite the clear statistical significance of 'working', its explanatory importance should not be exaggerated[53].

[53] The significance value (p = .013) for the retired category cannot be considered meaningful as two of the four cells involved have an expected count of less than five.

6.6.4 Household Income

As in the case of the two socio-demographic variables, there is a strong statistically significant relationship between employment status and household income[54] (χ^2 = 164.576, p = .000; φ = .323). From a tenure-neutral perspective, analysis of household income and categorised **migration distance** shows that, as in the case of employment status, there is very little association between the two factors (χ^2 = 14.607, p=.798). A three-way cross-tabulation that uses tenure as a control variable does however provide some evidence of inter-tenure difference, but nonetheless, illustrates that household income is statistically insignificant for both owner occupiers (χ^2 =20.680, p = .416; φ = .238), and private tenants (χ^2 =14.990, p= .777; φ= .148).

However, as in the case of employment status, a cross-tabulation of these three variables with household income as the control variable highlights a number of significant statistical relationships. As evidenced in Table 6.13 there is no statistically significant association between household income and the interaction of tenure and categorised migration distance (χ^2 = 7.364, p =.118), although the findings do highlight that the degree of association varies considerably across income category. In the case of the £10,000-£14,999 income group, there is a strong statistically significant association (χ^2 = 13.344, p= .010; φ = .493) which reflects the disproportionately higher propensity of private tenants in this income band to travel very short distances and their disproportionately lower propensity to travel long distances. There are also signs of an association of some importance in the case of the £20,000-29,999 income bracket, albeit at the 10% level (p = .076).

[54] The NIHCS collects household income on the basis of HRP plus spouse/partner if appropriate. It excludes the income of any adult children residing in the home.

Table 6-13: Categorised migration distance by tenure by household income: Inferential statistics

Household Income	N of Valid Cases	Chi-Square Value	Degrees of Freedom	Asymptotic Significance	Cramer's V Value
<£7,000	33	1.943	4	.746	.243
£7,000-9999	48	2.970	4	.563	.249
£10,000-14,999	55	13.344	4	.010	.493
£15,000-19,999	35	1.956	4	.744	.236
£20,000-29,999	45	8.450	4	.076	.433
£30,000 plus	46	2.447	4	.654	.231
Overall	262	7.364	4	.118	.168

Source: NIHCS combined 2006/2011 dataset, n = 262

However, some caution must be exercised with this analysis as it is based on a 6 X 5 crosstabulation with a considerable number of cells having less than 5 cases. In order to increase the sample size within each cell, the six income bands were recoded into three more meaningful bands: low income (<£15,000), middle income £15,000-29,999) and higher income (£30,000 plus). The key inferential statistics emerging from this recategorized cross-tabulation can be observed in Table 6.14. The findings confirm that there is a statistically significant association at the 5% level between household income and the interaction between migration distance and tenure for migrant households on lower incomes, and may to a large extent reflect the narrower horizons of migrants in the lower income bracket who reside in the private sector, and who, the data shows, are for the most part in either the 'not working' category or are retired, permanently sick or disabled or looking after the family / home.

Table 6-14: Categorised migration distance and tenure by household income: Inferential statistics

Household Income	N of Valid Cases	Chi-Square Value	Degrees of Freedom	Asymptotic Significance	Cramer's V Value
<£15,000	136	10.055	4	.040	.272
£15,000-29,999	80	3.065	4	.547	.196
£30,000 plus	46	2.447	4	.654	.231
Overall	262	7.364	4	.118	.168

Source: NIHCS combined 2006/2011 dataset, n = 262

As in the case of categorised migratory distance a tenure neutral cross-tabulation of household income and whether an **HMA boundary** was crossed shows little sign of any association ($\chi^2 = 5.056$, $p = .409$). Furthermore, even when tenure is introduced as a control variable there remains limited evidence of an association for both owner occupiers and private tenants (p =.698 and .389). A three-way analysis employing household income as the control variable shows that at the aggregate position, income levels are of little importance in influencing inter-tenure differences in migratory patterns. Likewise, there is little evidence for statistically significant relationships for any of the income bands.

In the case of **LGD boundaries**, the analysis initially mirrors the pattern emerging for employment status whereby the tenure-neutral analysis of household income and whether an LGD boundary is crossed shows little evidence of statistical association ($\chi^2 = 4.667$, $p = .458$). However, unlike in the case of HMA boundaries, a tenure-based analysis whilst not significant does reveal a considerable difference in the significance values for owner occupiers (p = .256) and private tenants (p = .957), which is also reflected in the φ values of .268 and .079 respectively.

The key inferential statistics from a three-way analysis in which household income acts as the control variable (Table 6.15), provides further evidence of inter-tenure differences. Indeed, for the sample as a whole, a χ^2 value of 8.708 (p = .003) indicates that income has a statistically significant influence on the relationship between tenure and propensity to cross an LGD boundary. This is, however, only significant

for the £10,000-14,999 income group ($\chi^2 = 8.689$, $p = .003$; $\varphi = .397$) and is a similar finding to the analysis based on categorised migratory distance reflecting the disproportionately high number of private tenants in this income bracket who do not cross an LGD boundary.

Table 6-15: LGD boundary crossed by tenure by household income: Inferential statistics

Household Income	N of Valid Cases	Chi-Square Value	Degrees of Freedom	Asymptotic Significance	Cramer's V Value
<£7,000	33	.733	1	.392	.243
£7,000-9999	48	.218	1	.640	.249
£10,000-14,999	55	8.689	1	.003	.493
£15,000-19,999	35	.037	1	.847	.236
£20,000-29,999	45	2.110	1	.146	.433
£30,000 plus	46	.149	1	.699	.231
Overall	262	8.708	1	.003	.168

Source: NIHCS combined 2006/2011 dataset, n = 262

The foregoing analysis based on four key interlinked socio-demographic and socio-economic variables presents a complex picture of the differential effects of these variables on inter-tenure differences in migratory patterns. However, a number of general discussion points with a bearing on the relationship between theory and evidence already emerge at this stage. Firstly, it is manifest that tenure does matter. The delineation of functional HMAs using self-containment criteria that are based largely on the household migration patterns of owner occupiers taken together with the clear propensity for private tenants to travel shorter distances means that inter-tenure analysis overall at the HMA level is fairly meaningless. However, in the case of migratory distance travelled and at the smaller LGD scale inter-tenure differences do become more apparent, and the analysis of these differences in combination with the four key analytical variables helps throws light on these contrasts and therefore on the underlying dynamics of the migratory patterns of private tenants and owner occupiers.

Secondly, and somewhat surprisingly, these four key variables on their own appear to have no statistically significant association with the propensity of migrant households *per se* to travel longer or shorter distances or to cross HMA or LGD boundaries. The only exception to this is age of HRP and in relation to the crossing of an HMA boundary where significance values are not far off the level required for statistical significance.

Thirdly, once tenure is introduced as a control variable, although the three-way relationships are not statistically significant, a number are very close to being significant at the p = 0.05 level and there is in most cases a clear differential in the significance levels of the relationship between owner occupiers and private tenants. Fourthly, it is when these four key variables are brought into the analysis as control variables that a number of statistically significant associations emerge.

6.7 Patterns of Migration: Capital Valuation and Dwelling Size

Chapter 5, section 5.4.3, highlighted some very considerable differences with regard to a number of the key property attributes[55] of the homes occupied by owner occupiers and private tenants who had moved house in the previous 12 month period. A preliminary examination of capital value data (section 5.4.4) demonstrated that these differentials were reflected in considerable inter-tenure contrasts in the typical valuations of the homes of these migrant households. This is unsurprising given their very different socio-demographic and socio-economic profiles (Chapter 5 sections 5.3.2 and 5.3.3).

The purpose of this section of the thesis is to analyse the interplay of these socio-economic and demographic variables with key physical characteristics of the dwellings in order to throw light on another important aspect of the theoretical foundations of defining and delineating HMAs and submarkets: the issues of spatial arbitrage and trading up or down. Two key variables – capital value and dwelling size (area) – are utilised to explore these market issues and again to highlight any emerging inter-tenure differences.

[55] The attributes selected from the NIHCS were age of dwelling, Decent Home Standard and SAP rating).

6.7.1 Capital value

The analysis of the migration distance travelled by migrant households within Northern Ireland in sections 6.4 and 6.6 was based on a combined sample of 262 owner occupiers (n=91) and private tenants (171). In this section the subsample sizes are marginally larger (n=92 and n=173 respectively), reflecting the fact that while capital values of the destination (current) properties are available for all but three migrant households, not all households interviewed provided sufficiently accurate origin address information to enable a migration distance to be calculated reliably.

Chapter 5 (Figures 5.5a and 5.5b) provided a general view of the spread of capital values by tenure for migrant households as a whole (including external migrants). In contrast, Table 6.16 is based solely on the data for internal migrants, but unsurprisingly again indicates major differences between the distributions of the capital values of the homes of owner occupiers and private tenants. It shows that the average capital value for owner occupiers was £123,353 compared to only £84,786 for private tenants, a difference of £38,567 (31%)[56]. This considerable difference is also evident in the trimmed means (£117,723 for owner occupiers and £80,284 for private tenants) and in the median values (£105,000 and £76,000). As in the case of migration distance, both the range and interquartile range of capital values are considerably greater for households in the owner-occupied sector, reflecting the propensity of households in the highest income brackets to live in this sector. The data for both tenures likewise displays a highly skewed distribution – more so in the case of private tenants (skewness = 2.865 compared to 2.202 for owner occupiers), reflecting the higher proportion of low value properties in the private rented sector.

[56] The standard error for each of these means is 6697 for owner occupiers compared to 3141 for private tenants – reflecting the much larger number of private tenants in the overall sample.

Table 6-16: Migrant households: Capital value of homes by tenure, 2006/11

Key Parameters	**Owner Occupiers**	**Private Tenants**
Mean (Std Error)	123353.26 (6697.438)	84786.13 (3141.938)
5% Trimmed mean	117723.43	80284.52
Median	105,000	76,000
Std Deviation	64,239.573	41,325.747
Range	433,000	345,000
Interquartile range	70,000	34,000
Skewness (Std Error)	2.202 (.251)	2.865 (.367)

Source: NIHCS combined 2006/2011 dataset, n = 265

There are also considerable inter-tenure differences with regard to the standard deviation of the two subsamples. The higher value for owner occupiers (64,239) compared to the value for private tenants (41,325), reflects the much greater range of properties in the owner-occupied sector in terms of size and quality. The *t*-test for equality of means (t = 5.213, p = .000) indicates that these differences in the data distributions are statistically significant, with the r-value[57] (0.414) confirming that tenure has a strong influence on determining capital value.

The underlying socio-demographic and socio-economic factors that explain these inter-tenure differences are well-recognised. Indeed, analysing both the age of HRP and household income (Section 6.6) provides some further contextual insights.

In order to undertake further analysis involving categorical variables, the actual recorded capital values were recoded into 5 bands that broadly reflect the distribution of the data (less than £70,000; £70,000-89,500; £90,000-109,500; £110,000-129,500; £130,000 and above). A tenure-neutral analysis of banded capital value and **age of HRP** indicates that the relationship is statistically significant (χ^2 = 28.570, *p* = .027). This is not unexpected given the relationship between life course and income and the influence of the latter on the size/quality of the dwelling that a household can afford, although a φ value of .164 indicates that overall the effect size

[57] $r = \sqrt{\frac{5.213^2}{5.213^2 - 132.077}} = 0.414$

is relatively weak. However, a three-way cross-tabulation applying tenure as a control variable shows that the corresponding figures for owner occupiers (χ^2 = 18.897 p = .091) and private renters (χ^2 = 24.576, p = .078) are only significant at the 10% level, undoubtedly due to the smaller subsample sizes. Nevertheless there is a clear difference in the φ values (.262 for owner occupiers – a moderate effect size - and only .188 for private tenants – a weak effect size), suggesting that tenure is perhaps a more important factor in the relationship between capital value and age of HRP for owner occupiers than for private tenants.

Key inferential statistics emerging from a three-way cross-tabulation using age of HRP as the control variable (Table 6.17), sheds more light on the interplay between these factors. Not unexpectedly, the findings illustrate that the relationship between capital value, tenure and age of HRP is statistically significant (p < 0.05) and the related φ values indicate that the corresponding effects are strong[58]. For the three younger age groups (17-24, 25-39 and 40-59)[59], the relationship between capital value and tenure are all statistically significant at the 5% and 1% level (p = .024, .003 and .001) and the corresponding φ values also demonstrate strong effect sizes (φ = .430, .365 and .517 respectively). Age of HRP is significant for the interaction between capital value and tenure at the 10% level (p = .093).

Table 6-17: Banded capital value and tenure by age of HRP: Inferential statistics

Age Group	N of Valid Cases	Chi-Square Value	Degrees of Freedom	Asymptotic Significance	Cramer's V Value
17-24	51	9.436	3	.024	.430
25-39	121	16.154	4	.003	.365
40-59	71	19.009	4	.001	.517
60-74	19	7.969	4	.093	.648
75 plus*	3				
Overall	265	38.748	4	.000	.382

*No inferential statistics are calculated because tenure is constant

Source: NIHCS Combined 2006/2011 dataset, n = 265

[58] A cross-tabulation between banded capital value and tenure for internal migrant households produces a statistically significant p value of .000 and a φ value of .382.

A more detailed examination of the associated observed and expected counts table shows that a disproportionately high number of private tenants in the 17-24 age group are located in the lowest capital value band (£25,000-£69,000), reflecting their typically lower income. Conversely, a disproportionately higher number of owner occupiers in this age group reside in housing with a capital value of between £90,000 and £109,000 typically associated with purchases by first-time buyers. In the case of households with an HRP aged 25-39 or 40-59, the differentials are much clearer, with a disproportionately high number of private tenants living in the two lowest capital value bandings and a disproportionately high number of owner occupiers living in the two highest bands – a contrast that in both cases is particularly obvious in the £130,000 plus band.

The relationship between a person's **age and income** is generally well recognised in housing research literature. The cross-tabulation evidence from this study examining household incomes and the age of the HRPs of migrant households substantiates this position, expectedly, illustrating that, that household incomes and age of HRP are statistically associated (p = .000). What is of more interest in the context of this thesis, however, is that when tenure is applied as a control variable, the relationship between incomes and age of HRP remains significant (p = .020) for owner occupiers, but is marginally outside the 5% level of significance for private tenants (p = .055), despite the subsample of private tenants being approximately twice as large as the one for owner occupiers. This differential is confirmed by the Cramer's V value for owner occupiers which displays a moderate effect (φ = .320) compared to that of private renters (φ = .210) – a further indication of the likelihood of inter-tenure differences in the dynamics underpinning migratory patterns.

The results of tenure neutral analysis of capital value and **household income** suggest that, as in the case of age of HRP, the association between household income and capital value is statistically significant (χ^2 = 85.524, p = .000), and in this case the level of association is even stronger. However, utilising tenure as a control variable presents a somewhat different outcome compared with the capital value and age of HRP analysis. In terms of the relationship between household income and capital value, owner occupiers show statistically significant results (χ^2 = 42.336, p =.002),

whereas for private tenants the findings fall marginally outside the 10% level of significance ($\chi^2 = 28.167$, $p = .105$). Again, this inter-tenure difference is reflected in the strength of the effect size ($\varphi = .679$ for owner occupiers; $\varphi = .404$ for private tenants).

A three-way cross tabulation of these variables with household income applied as the control variable provides further important insights. The results exhibit a statistically significant association at the aggregate level between the interaction of banded capital value and tenure with household income for two of the six income categories – for the <£7,000 income band ($p = .034$ and $\varphi = .570$) and for the £30,000 plus category ($p = .013$ and $\varphi = .525$). However, as noted in section 6.6, some caution must be exercised with this analysis as it is based on a crosstabulation[60] with a considerable number of cells comprising less than five cases. Appositely, the analysis was repeated using the three more meaningful income bands as (Table 6.18). The findings reveal that in the case of the homes of households on higher incomes, the relationship between income and the interplay of tenure and capital value is statistically significant ($\chi^2 = 12.671$, $p = .013$), demonstrating a strong effect ($\varphi = .525$). This is further contextualised by the expected and observed counts, which demonstrate that owner occupiers on incomes of £30,000 or more are not only absolutely, but more importantly disproportionately, likely to live in homes with capital values of £130,000 or more and conversely that private tenants in this income bracket are disproportionately likely to live in homes with capital values ranging from £25,000 to £89,500. In the case of the other two income brackets, the association between income and the relationship between tenure and capital value is weaker, illustrated, for example, by the young professionals in the middle income band, who live in properties with a capital value of more than £130,000 in areas of high demand such as South Belfast[61].

[60] A 6x5 matrix

[61] Legislatively, these properties of 2 or 3 adults are not considered to be Houses in Multiple Occupation.

Table 6-18: Banded capital value and tenure by household income: Inferential statistics

Household Income	N of Valid Cases	Chi-Square Value	Degrees of Freedom	Asymptotic Significance	Cramer's V Value
<£15,000	137	7.082	4	.132	.227
£15,000-29,999	82	6.625	4	.157	.284
£30,000 plus	46	12.671	4	.013	.525
Overall	265	38.748	4	.000	.382

Source: NIHCS combined 2006/2011 dataset, n = 265

6.7.2 Dwelling size (area)

An initial exploration of the data on dwelling size (area in m^2) confirms that, as in the case of capital value, there are major differences between owner occupied homes and those in the private rented sector. As shown in Table 6.19, the average size of owner-occupied homes was $129m^2$, whereas the comparable figure for the private rented sector is 26 per cent lower ($95m^2$). Similarly, applying the trimmed mean (5%), also shows that privately rented properties are typically 25 per cent smaller than owner occupied ones. Unlike in the case of capital value (and despite their statistically significant association), the range of dwelling sizes is larger in the case of privately rented properties ($325m^2$ compared to $293m^2$), whereas, as in the case of capital value, the interquartile range is much higher for owner occupied properties ($77.5m^2$ compared to $33.5m^2$). These somewhat counter-intuitive combination of statistics reflects the fact that although the smallest dwellings are in the privately rented sector, and that this sector contains a disproportionate number of small dwellings with low capital values, there are a small number of much larger, mainly older, properties in the private rented sector that do not attract the same high level of capital value. The very different shape of the distributions of the data for the two tenures is also reflected in the much higher level of skewness for privately rented properties (2.978) compared to only 1.266 for owner-occupied ones.

Table 6-19: Migrant households: Dwelling size (m^2) by tenure, 2006/11

Key Parameters	**Owner Occupiers**	**Private Tenants**
Mean (Std Error)	129.1848 (6.88649)	94.9422 (2.65983)
5% Trimmed mean	123.9686	92.5703
Median	106.5000	92.0000
Std Deviation	66.05291	34.98467
Range	293.00	325.00
Interquartile range	77.75	33.50
Skewness (Std Error)	1.266 (.251)	2.978 (.185)

Source: NIHCS combined 2006/2011 dataset, n = 265

A considerable inter-tenure difference is also apparent in relation to the standard deviation of the two subsamples. Again, as in the case of capital value, it is the subsample of dwellings in the private rented sector that displays the lower standard deviation (approximately 35 compared to 66). These inter-tenure differences in the data distributions in relation to dwelling size are confirmed by the t-test which indicates that these differences are statistically significant at the 5% level (t = 4.638, p = .000). The corresponding r-value (0.391) confirms that tenure has a reasonably strong association with dwelling size that is comparable to the one for capital value (.414). This obviously reflects the fact that although dwelling size is by no means the only determinant of capital value, it is a very important component in this relationship. Moreover, it also suggests that the underlying motivations and migratory patterns of private tenants and owner occupiers may be different.

As with the analysis of capital value, the data for dwelling size was banded into 5 categories to enable the assessment of statistical significance of the relationship between dwelling size, age of HRP and household income. The five categories were chosen on the basis that, firstly, each category contained broadly the same number of cases to ensure sample representativeness and, secondly, that they related to typical residential space standards that broadly reflect guidelines set out by the Department for Communities for general needs housing[62].

[62] The five categories are broadly as follows:

(1) Up to 70m^2: 2/3 bedroom flats and 2 bedroom terraced houses (2/3persons)

A tenure neutral analysis of the banded dwelling size and **age of HRP** confirms a statistically significant association (χ^2 = 39.432, p = .001). Again, similar to capital value, the associated φ value of .193 indicates that the effect size is fairly weak. However, when tenure is included as a control variable in the three-way cross-tabulation, the resulting inferential statistics show that for owner occupiers the relationship is only significant at the 10% level (χ^2 = 19.764, p = .072), whereas for private tenants it is significant at the 1% level (χ^2 = 34.946, p =.004). This outcome contrasts quite sharply with the capital value-based analysis where neither of the two tenure-based figures was statistically significant. This finding suggests that tenure is a more important factor in the relationship between dwelling size and age of HRP for private tenants than for owner occupiers. Indeed, the associated φ value is also considerably higher for dwelling area for private tenants (φ = .225 – a moderate effect size) compared to the capital value analysis for private tenants, whereas in the case of owner occupiers the two values are broadly the same (φ = .268 for dwelling size and .262 for capital value).

Not unexpectedly, the statistics emerging from a three-way cross-tabulation (Table 6.20) utilising age of HRP as the control variable produces a similar pattern to that based on capital value. They show that the overall relationship between dwelling size, tenure and age of HRP is statistically significant ($p < 0.05$) and the related φ value of .271 indicates a moderate effect – figures that are not dissimilar to the ones based on capital value. Nonetheless, the pattern emerging from the age group-based analysis shows a somewhat different pattern. As in the case of capital value, age of HRP is statistically significant at the overall level (χ^2 = 19.393, p = .001) for understanding the relationship between dwelling size and tenure. However, when examining the age groupings only the 25-39 and 40-59 age groups are significant (p = .019 and p = .009) and display fairly strong effects ($\varphi = .312$ and .436 respectively).

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(2) 70-84m^2: 2/3 bedroom terraced houses (4 persons)
(3) 85-99m^2: 3 bedroom semi-detached houses (5persons)
(4) 100-114m^2: 3/4 bedroom semi-detached and 3 bedroom detached houses (6 persons)
(5) 115m^2 or more: 4/5 bedroom detached houses (6+ persons)
https://www.communities-ni.gov.uk/sites/default/files/publications/dsd/hagds-general-needs-housing.pdf

Unlike capital value, age of HRP is not significant for either the 17-24 or 60-74 age categories.

Table 6-20: Banded dwelling size and tenure by age of HRP: Inferential statistics

Age Group	N of Valid Cases	Pearson Chi-Square Value	Degrees of Freedom	Asymptotic Significance	Cramer's V Value
17-24	51	3.693	4	.449	.269
25-39	121	11.813	4	.019	.312
40-59	71	13.469	4	.009	.436
60-74	19	5.295	4	.258	.528
75 plus*	3				
Overall	265	19.393	4	.001	.271

*No inferential statistics are calculated because tenure is constant

Source: NIHCS combined 2006/2011 dataset, n = 265

Furthermore, a comparison of the associated observed and expected counts reveals a number of noteworthy disproportionalities in the 25-39 and 40-59 age groups that help explain the statistical significance of age of HRP as a factor in differentiating the propensity of private tenants and owner occupiers to live in a dwelling of a specific size. In the 25-39 age group both an absolutely and disproportionally higher number of private tenants live in homes with a dwelling size in the middle three bands, whereas, and in contrast, an absolute and disproportionally high number of owner occupiers live in homes in the lowest (<70m^2) and highest bands (115m^2). For the 40-59 age group, the pattern is somewhat different. In this case an absolute and disproportionately higher number of private tenants occupy the smallest homes and homes in the 85-99m^2. In contrast, as in the 25-39 age group, an absolute and disproportionately higher number of owner occupiers live in properties in the highest size band. These findings suggest that at one end of the spectrum these disproportionalities reflect the tendency for first time buyers (in the 25-39 age group) on lower incomes to begin with small properties in order to gain a foothold in the mainstream owner occupancy market and thereby can, and are more likely to, trade-up to more expensive housing as their age increases. At the other end of the spectrum, higher earning owner occupiers in both age categories are better placed to be able to afford larger more expensive properties. The disproportionately lower

number of private tenants the 25-39 age who reside in properties in the smallest group may reflect the growth of the buy to let sector where even tenants on lower incomes could access mid-sized properties, often with the aid of housing benefit.

A tenure neutral analysis of dwelling size and **household income** exhibits a statistically significant association with a moderately strong effect (χ^2 = 42.710, p = .000; φ = .284). When tenure is added as a control variable, a more nuanced picture emerges. The association between income and dwelling area is statistically significant in the case of both tenures, but less so for private tenants (*p* = .000 for owner occupiers and .014 for private tenants), a finding that is reinforced by the difference in the size of the effect (φ = .419 for owner occupiers; φ = .236 for private tenants).

A three-way cross tabulation of dwelling size and tenure using household income as the control variable provides further detail about these relationships. As in the case of the relationship between capital value and income, the analysis was undertaken on the basis of three income bands. The cross-tabulation results (Table 6.21), show that while the overall pattern is similar to the analysis for capital value and tenure, there are major differences in terms of degree, that are reflected in the *p values*. Overall, the analysis once again confirms that the association between tenure and dwelling size and household income is statistically significant (χ^2 =19.393, *p* = .001). However, this is accounted for by the very strong association for higher income households (χ^2 =24.077, *p* = .000 and φ = .723), whereas for the lower and middle income brackets the findings show no significance.

Table 6-21: Banded dwelling size and tenure by household income: Inferential statistics

Household Income	**N of Valid Cases**	**Chi-Square Value**	**Degrees of Freedom**	**Asymptotic Significance**	**Cramer's V Value**
<£15,000	137	2.217	4	.696	.127
£15,000-29,999	82	.477	4	.976	.076
£30,000 plus	46	24.077	4	.000	.723
Overall	265	19.393	4	.001	.271

Source: NIHCS combined 2006/2011 dataset, n = 265

Comparison of the expected and observed counts shows that, for example, while there is a clear absolute difference in terms of the number of lower income (<£15,000) households in the private rented sector, this does not result in a disproportional propensity to occupy dwellings of a smaller size. In contrast, the higher income band (£30,000 plus) is, not unexpectedly, dominated by owner occupiers, but there are also a disproportionately higher number of owner occupiers in the largest dwellings and conversely a disproportionate number of private tenants in dwellings of 85-99m^2, mostly supported by Housing Benefit. Again, as in the case of capital value, a more forensic analysis of the wider dataset provides further insights that help explain these inter-tenure similarities and differences in the interplay between tenure, income and dwelling size. This analysis reveals, for example, owner occupiers on modest incomes occupying smaller homes as well as the more obvious older larger families on higher incomes occupying the largest homes, often in more rural areas.

6.8 Patterns of Migration: Spatial Arbitrage and Trading Up and Down

This section of Chapter 6 focuses on two elements of the economic theory underpinning the definition and delineation of functional housing markets and submarkets. Firstly, it examines the theoretical assumption of the preponderance of internal spatial arbitrage within individual HMAs in which residents "trade constant quality goods" (dwellings) in a geographical area where standardised dwelling prices tend to uniformity. By implication, the ratio of dwelling area to capital value of origin and destination properties should be approximately aligned[63]. Comparing the ratios of dwelling size to capital value between origin and destination addresses is envisaged as providing an (admittedly somewhat crude) indicator of the housing choice decisions underlying the migratory patterns of households who remain within their respective HMAs. Secondly, recognising the market imperfections that lead to the development of submarkets within an HMA, the tendency for households moving

[63] In order to simplify what would otherwise be overly complex analysis, dwelling size has been chosen as the key variable representing the bundle of attributes determining the capital value of a property. The regression analysis underpinning the NI House Price Index, for example, uses dwelling size as a key variable in determining market value (house price) https://www.finance-ni.gov.uk/sites/default/files/publications/dfp/NI%20House%20Price%20Index%20methodology%20report%20.pdf.

within a submarket to trade up, in contrast to households moving across submarkets, who tend to be trading down. This issue is examined by comparing the capital values of origin and destination addresses for migrants in the Belfast HMA in relation to whether they cross submarket boundaries.

The analysis is also mindful of the critique of the analytical work undertaken by Jones and Coombes (2013) that concludes that household migration patterns which are tenure-specific provide a better basis for assessing the extent of spatial arbitrage (Chapter 2, section 2.4.2). The analysis therefore focuses on households who move within a specific HMA and on cases where tenure of origin and destination properties remains constant. In addition, the analysis excludes moves involving households leaving the parental home to become a first-time buyer or renter. This reduces the sample size considerably (to 38 for owner occupiers and 92 for private tenants) but is considered to provide a more meaningful analysis.

However, in order to provide a broader context to this more detailed analysis an initial exploration of inter-tenure differences of the ratio of capital value to dwelling size (effectively an indicator of price per square metre) was undertaken in relation to the destination (current) properties of all internal migrant households (n = 265). Table 6.22 confirms that there are considerable differences between the ratio of capital value to dwelling size (£/m^2) of owner-occupied homes compared to privately rented ones. The average ratio 'price' per square metre for owner-occupied homes is £1,001 compared to £912 for the private rented sector. Similar to capital value, the range on a price per square metre basis is considerably larger for privately rented properties (£1,805/m^2) in comparison to owner occupied ones (£1,379m^2). However, the standard deviations for both subsamples are more similar, as are the interquartile ranges, a contrast that is reflected in the much more skewed distribution of the data for the private rented sector (1.203 compared to .880 for the owner-occupied sector).

Table 6-22: Migrant households: Ratio of capital value to dwelling size (£/m²) by tenure, 2006/11

Key Parameters	Owner Occupiers	Private Tenants
Mean (Std Error)	1001.3089 (31.30734)	912.2119 (23.21305)
Median	947.5698	869.5652
Std Deviation	300.28950	305.32002
Range	1378.55	1805.41
Interquartile range	362.45	324.75
Skewness (Std Error)	.880 (.251)	1.203 (.185)

Source: NIHCS combined 2006/2011 dataset, n = 265

Testing for inter-tenure differences with regard to the ratio between capital value and dwelling size, the t-test shows that there is statistical significance (t = 2.274, *p* =.024). Despite this level of significance, assessment of the r-value (0.164)[64] confirms that tenancy has a relatively weak association with the ratio of capital value to dwelling size, compared to its association with capital value (.414), suggesting that despite the differences in mean, median and range there is some degree of consistency in the £/m^2 ratio for both tenures.

6.8.1 Spatial arbitrage

Table 6.23 furnishes the key statistics emerging from a comparison of the price per square metre (£/m^2) ratios between origin and destination properties of internal migrants whose tenure status has remained constant and who did not cross an HMA (n = 130). Interestingly, the results show a remarkable inter-tenure consistency in terms of both the means and the medians (all approximately 1.0). This implies that migrants who remain within their respective HMA are arguably "trading constant quality goods" (dwellings) in an area where standardised prices tend to uniformity – the diagnostic characteristic of a market – and that this applies equally to both tenures. In many ways this is not surprising and confirms the considerable influence that dwelling size has on capital value regardless of tenure (both owner-occupied and privately rented). However, Table 6.23 does indicate that there are still inter-tenure differences most notably reflected in the much bigger standard deviation, range and

[64] $r = \sqrt{\frac{2.274^2}{2.274^2+188.429}} = 0.164$

skewness of the data for moves in the private rented sector – suggesting that while the measures of central tendency are similar for both tenures, the apparent overall consistency in terms of £/m^2 is achieved in a much more inconsistent way in the private rented sector – as represented in the boxplot schematic (Figure 6.5). This issue is further explored below using a combination of derived categorical variables.

Table 6-23: Migrant households (tenure constant): Ratio of capital value to dwelling size (£/m^2) by tenure – origin-destination ratio of ratios, 2006/11

Key Parameters	Owner Occupiers (Std Error)	Private Tenants (Std Error)
Mean (Std Error)	1.0688 (.04317)	1.0365 (.03879)
Median	1.0392	1.0000
Std Deviation	.26613	.37207
Range	1.23	2.53
Interquartile range	.38	.30
Skewness (Std Error)	.582 (.383)	1.502 (.251)

Source: NIHCS combined 2006/2011 dataset, n = 130

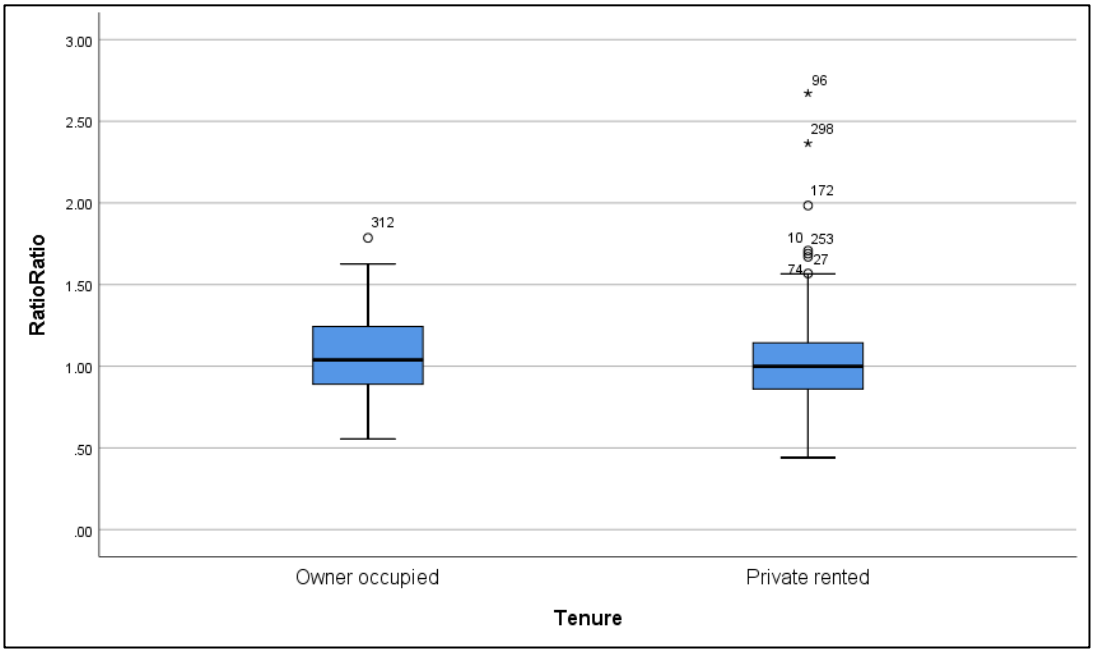

Figure 6-5: Migrant households (tenure constant): Ratio of capital value to dwelling size (£/m^2) by tenure – origin-destination ratio of ratios: Boxplot

Given the smaller sample size available for this part of the analysis, the ratio expressing the difference between the ratios of capital value to dwelling size (£/m^2) for origin and destination properties were recoded into three bands that almost

exactly coincided with a division based on terciles. The middle band (0.91-1.10, effectively within a range of plus or minus 10 per cent) reflects a situation where the homes are considered to be traded at approximately constant quality/standardised price, whereas in the case of the upper band (more than 1.10) the ratio (£/m^2) for the destination dwelling is more than 10 per cent higher than the ratio for the origin dwelling, while for the lower band (0.90 or less) the reverse is the case.

An initial cross tabulation between tenure and the ratio terciles indicates that the relationship between the ratio expressing the difference between the ratios of capital value to dwelling size for origin and destination dwellings is not statistically significant (χ^2 = .499 with 2 degrees of freedom and a *p* value of .779). The associated φ value of .062 likewise indicates the weakness of this association. Indeed, introducing age of HRP and household income into this relationship confirms that the inter-tenure differences are minimal and that neither of the key socio-demographic nor socio-economic variables alter this position. Tables 6.24 and 6.25 illustrate these findings.

Table 6-24: Ratio of origin to destination ratios: (£/m^2) and tenure by age of HRP: Inferential statistics

Age Group	N of Valid Cases	Chi-Square Value	Degrees of Freedom	Asymptotic Significance	Cramer's V Value
17-24	17	1.747	2	.417	.321
25-39	62	.134	2	.935	.047
40-59	39	.951	2	.622	.156
60-74	11	1.253	2	.535	.337
75 plus*	1				
Overall	130	.499	2	.779	.062

*No inferential statistics are calculated because tenure is constant

Source: NIHCS combined 2006/2011 dataset, n = 130

Table 6-25: Ratio of origin to destination ratios (£/m²) and tenure by household income: Inferential statistics

Household Income	N of Valid Cases	Chi-Square Value	Degrees of Freedom	Asymptotic Significance	Cramer's V Value
<£15,000	72	2.634	2	.268	.191
£15,000-29,999	34	.199	2	.905	.076
£30,000 plus	24	1.705	2	.426	.267
Overall	130	.499	2	.779	.062

*No inferential statistics are calculated because tenure is constant

Source: NIHCS combined 2006/2011 dataset, n = 130

In the case of age of HRP the p values for both the three-way relationship overall and for each of the age groups is well outside the level required for statistical significance at the p = 0.05 level, although there is a moderate effect in the case of households with a HRP aged either 17-24 or 60-74 (φ = .321 and 337 respectively). The analysis based on household income produces essentially the same outcome. The strongest association is for households with an income of less than £15,000 (p = .268), but clearly not statistically significant.

Taken in conjunction with the descriptive and inferential statistics set out in Tables 6.16-6.21, the analysis contained in this subsection (6.8.1) confirms that although there are clear indications of statistically significant inter-tenure differences in terms of the housing circumstances of owner occupiers and private tenants and the underlying socio-economic and demographic factors influencing them, this does not impact significantly on the degree to which both owner occupiers and private tenants trade "constant quality" dwellings (spatial arbitrage) within HMAs where standardised prices tend to uniformity. More specifically, Tables 6.23-6.25 indicate that although there are inter-tenure differences both in terms of the consistency of the propensity of owner-occupiers and private tenants to trade "constant quality" dwellings, and in terms of the socio-economic and demographic factors that could be viewed as important explanatory variables, they are not sufficiently large to merit statistical significance. The greater inconsistency in relation to spatial arbitrage for private tenants may well reflect the more variegated nature of the dwelling stock in

the private rented sector, but also important inter-tenure differences in the motivations for migration.

6.8.2 Trading Up and Trading Down

An initial analysis of whether migrant households traded up or down was carried out on the basis of all internal migrant households where tenure of origin and tenure of destination dwellings remained constant[65] (n = 46 for owner occupiers; n = 101 for private tenants). Key statistics emerging from an initial exploration of the data are set out in Table 6.25.

As in the case of the analysis of the capital value of destination dwellings (Section 6.7.1) Table 6.26 shows that there is a significant inter-tenure variation in the difference between capital values of origin and destination dwellings. While both owner occupiers and private tenants typically trade up, the mean difference in capital value of 28 per cent (median 25%) compared to only 9 per cent (median 3%) for private tenants would suggest differences in migratory patterns. The standard deviations, ranges and interquartile ranges for both subsamples also display considerable differences.

Table 6-26: Migrant households: Ratio of capital value of origin to destination dwelling by tenure

Key Parameters	**Owner Occupiers**	**Private Tenants**
Mean (Std Error)	1.2731 (0.8142)	1.0873 (.04442)
Median	1.2520	1.0313
Std Deviation	.55224	.44642
Range	2.41	2.92
Interquartile range	.71	.48
Skewness (Std Error)	.426 (.350)	1.403 (.240)

Source: NIHCS combined 2006/2011 dataset, n = 147

[65] Moves out of the parental home were again excluded.

The associated t-test statistic (t = 2.004) is statistically significant at the 5% level (*p* = .049). The r value resulting from (0.228)[66] confirms that tenancy has a moderate influence on the propensity to trade up.

In order to explore these inter-tenure contrasts in more depth the ratio of the difference between the capital values of origin and destination dwellings were categorised into three terciles. The middle band (0.91-1.24, effectively within a range of plus 24 per cent or minus 10 per cent) reflects a situation where the capital values of homes are considered to be *broadly* similar, whereas in the case of the upper band (1.25 or more) the ratio (£/m^2) for the destination dwelling is more than 25 per cent higher than the ratio for the origin dwelling, while for the lower band it is at least 10 per cent less.

The inferential statistics from a three-way cross tabulation of these three bands with age of HRP (Table 6.27) show that not only is the association of banded ratio and tenure significant overall (p = 0.016) at the 5% level, but that the association is particularly strong in the case of the 25-39 age group (*p* = .009 and φ = .380. Conversely, for the 17-24 and 40-59 age groups the equivalent *p* values are well outside the required level for statistical significance (*p* = .649 and .228 respectively). A comparison of expected and observed counts for the 25-39 age group shows that a disproportionately low number (zero) of owner occupiers trade down, while a disproportionately high number (13) trade up. For private tenants the reverse is true: a disproportionately high number of them trade down (12) and a disproportionately low number trade up (15).

[66] $r = \sqrt{\frac{2.004^2}{2.004^2+72.867}}$ = 0.228

Table 6-27: Migrant household: Ratio of capital value or origin to destination dwelling by tenure and age of HRP: Inferential statistics

Age Group	N of Valid Cases	Chi-Square Value	Degrees of Freedom	Asymptotic Significance	Cramer's V Value
17-24	20	.864	2	.649	.208
25-39	66	9.515	2	.009	.380
40-59	47	2.439	2	.295	.228
60-74	12	1.543	2	.462	.359
75 plus*	2				
Overall	147	8.268	2	.016	.237

*No inferential statistics are calculated because tenure is constant

Source: NIHCS combined 2006/2011 dataset, n = 147

This pattern can be partly explained by the smaller subsample, but more likely reflects the different housing transitions experienced by owner occupiers and private tenants. In the case of the former higher incomes and more secure jobs enable them to move up the ladder of owner occupancy in a tenure where there is a greater choice in terms of the range of properties at critical periods in the life cycle (for example, having children or additional children), whereas for private tenants lower incomes and greater job insecurity makes trading up by a significant amount (25%) more difficult in a sector where there may also be less choice in an appropriate location.

The data does not allow these issues to be explored in detail, but the equivalent analysis based on household income rather than age of HRP provides some support for this interpretation and suggests that the relationship between tenure and trading up or down is more complex than merely one that reflects levels of income. The inferential statistics (Table 6.28) indicate that income is statistically significant overall in terms of the relationship between trading up or down and tenure, but that it is not so for any of the 3 income bands. Again, this is no doubt partly due to smaller subsample sizes, but the lack of statistical significance at the p = 0.05 level and the only moderate effect size in the case middle or higher income bands – households who would be most likely to trade up – suggests that the interrelationship between tenure and trading up or down is more complicated than simply a reflection of income.

Table 6-28: Migrant households: Ratio of capital value of origin to destination dwelling by tenure and household income: Inferential statistics

Household Income	N of Valid Cases	Chi-Square Value	Degrees of Freedom	Asymptotic Significance	Cramer's V Value
<£15,000	79	3.017	2	.221	.195
£15,000-29,999	39	2.858	2	.239	.271
£30,000 plus	29	1.634	2	.442	.237
Overall	147	8.268	2	.016	.237

Source: NIHCS combined 2006/2011 dataset, n = 147

So far, the analysis has been based on an analysis of all internal migrant households where tenure of origin and destination dwellings remained constant. The theory underpinning functional housing market indicates that migrant households tend to trade up within submarkets but trade down when they are crossing submarkets. The size of the dataset for the Belfast HMA, the only HMA for which submarkets have been identified in Northern Ireland, permits only some somewhat rudimentary analysis. Capital value information for both origin and destination dwellings was only available for a total 72 migrant households who crossed a Belfast HMA housing submarket boundary and where tenure remained constant.

A tenure neutral analysis of these 72 cases shows that the relationship between trading up or down and whether a submarket boundary is crossed is not statistically significant at the 5% level (p = .336). However, there is a difference between the significance value for owner occupiers (p = .244) and private tenants (p = .151), a difference that is reflected in the effect sizes (φ = .312 for owner occupiers and .391 for private tenants). The significance of this three-way relationship is clarified further by a cross tabulation of the same variables but with the variable indicating whether a submarket boundary has been crossed as the control variable. Table 6.29 presents the key inferential statistics.

Table 6-29: Belfast HMA migrant households: trading up/down and tenure by crossing a submarket boundary: Inferential statistics

Cross Submarket Boundary	N of Valid Cases	Chi-Square Value	Degrees of Freedom	Asymptotic Significance	Cramer's V Value
Did not Cross	53	3.767	2	.152	.267
Crossed	6	6.000	2	.050	1.000
Crossed HMA too	13	3.343	2	.188	.507
Overall	72	4.118	2	.128	.239

Source: NIHCS combined 2006/2011 dataset, n = 72

Caution must be exercised when interpreting these figures. The 13 cases where both a HMA boundary (either leaving Belfast HMA or entering it from another HMA) as well as a submarket boundary must be set aside for the purposes of theoretical testing. Most of the remainder of the sample did not cross a submarket boundary. Theory suggests that these migrant households should be trading up. However, only 17 actually do, although these include a disproportionately high number of owner occupiers, whereas a disproportionately high number of private tenants who move within a submarket do not trade up or down (p = .152). Only six households actually cross a submarket boundary. Five of these are private tenants and four of these five trade down. This disproportionality is reflected in a p value of .050 (a statistic that is on the borderline of statistical significance at the p = 0.05 level). The theoretical conclusions that can be drawn from this are limited. However, the disproportionality with regard to those households who do not cross a submarket boundary (n = 53) does suggest that owner occupiers are more likely to conform to the theoretical position that states that those moving within the same submarket tend to be trading up.

6.9 Patterns of Migration: Households Crossing HMA Boundaries and Reasons for Moving – Qualitative Insights

The previous two sections of this chapter have used essentially quantitative techniques to analyse data that provides a range of insights into the extent to which the evidence emerging from the House Condition Surveys lends credence to the theoretical propositions in relation to the migration patterns of households who have moved within HMAs. This section adopts a more qualitative approach that reflects

the small sample sizes available for analysis. Firstly, it examines migratory information relating to the relatively small number of households who crossed HMA boundaries (n=28), most of whom were private tenants (n = 17) and, secondly, it analyses the available data on reasons for moving provided by respondents in the 2009 and 2011 surveys[67].

6.9.1 Crossing HMA boundaries

Section 6.6.2 highlighted the statistically significant association (p = .022) between household type and crossing an HMA boundary. An examination of the expected and observed counts underpinning this reveals that this is due to the disproportionately high number of two adult and large family households crossing HMA borders and, conversely, the disproportionately low number of lone adults and lone parents. However, once tenure is added as a control variable to this analysis the p value is not significant for either tenure (p = 0.094 for owner occupiers and .268 for private tenants), although there is a considerable difference in these two values. Likewise, a two-way crosstabulation of household type and tenure for the 28 households who crossed an HMA boundary produces a significance level of .243. Both of these statistics mirror the finding reported section 6.5 that showed that there is no statistically significant relationship at the 5% level between tenure and whether an HMA boundary has been crossed (χ^2 = .287 with 1 degrees of freedom and a p value of .592).

However, Section 6.5 already provided one important inter-tenure difference in that owner occupiers who tended to cross HMA boundaries moved longer distances and were normally exiting the Belfast HMA, whereas private tenants moved shorter distances and in approximately one third of the cases their destination HMA was Belfast.

The key theoretical position in relation to households crossing HMA boundaries is that this move is normally sparked by an important life cycle event such as retiring or changing job. Unfortunately, data on the reason for moving is only available in combination with location of both origin and destination location from the 2011

[67] Section 6.3 noted that this information was not collected as part of the 2006 survey.

dataset for only six cases. In the case of the four owner occupiers the reasons given were: ‘to be nearer family and friends’ (in the case of two households), ‘to move to the second family home’ and ‘to set up home with my partner’. For the two private tenants the reasons were: ‘no suitable home in the previous area’ and ‘wanted a different area’.

Section 6.6.1 highlighted what appeared to be a weak association between HRP, tenure and crossing an HMA boundary. Further light can be thrown on the issue by examining the age of HRP and employment status by tenure specifically for the 28 households who actually crossed an HMA boundary. The analysis shows a marginally disproportionate number of owner occupied households in the 25-39 and 40-59 age groups who are in the ‘working’ category, whereas marginally disproportionate numbers of private tenants are in four of the five remaining categories (‘not working’, retired, permanently sick/disabled or ‘looking after family/home’). However, although there is some evidence of inter-tenure differences, there is no substantial evidence to support the theoretical contention that moves between HMAs are sparked by major life cycle events or changing jobs – even in the case of owner occupiers.

6.9.2 Reasons for moving

The data on reasons for moving is more robust than for crossing an HMA boundary. The data from the 2009 survey comprises reasons for moving given by 94 households. Respondents were given the opportunity to provide a main reason and a secondary explanatory comment if appropriate. There was a reasonable overlap between the responses of private tenants and owner occupiers in relation to three broad reasons (31 respondents) for moving and these responses were also roughly proportional to the overall tenure split. These were as follows: twelve respondents who wanted or needed a bigger property, eight of whom were in the private rented sector; thirteen respondents who simply stated that they wanted to buy their own property or set up home with a partner, seven of whom were private tenants; six respondents stated they wanted to live in a different area, four of whom were private tenants.

However, in the case of the remaining 63 respondents there were significant inter-tenure differences. In the case of private tenants the more common responses were as follows: no suitable properties in area of origin (4); wanted to reduce housing costs (3); wanted to be nearer work (5); change in employment (8) ; to be nearer family/friends (4); disliked previous area (3); quality of previous home (7); relationship breakdown (7). For owner occupiers there were very few other reasons, including: relationship breakdown (1); to be nearer schools and services (1); wanted a smaller garden (1).

In 2011, a total of 71 respondents provided reasons for moving, of whom 19 were owner occupiers. Three main reasons were cited: six wanted to buy a property or set up home with a partner; four wanted to be near family or friends and two wanted to live in a different area. Again, this contrasts to a certain extent with the response of private tenants: seven wanted a bigger home; eight wanted to be nearer family and friends; five were setting up home. Again, there were smaller numbers who had to leave because their landlord was selling the property or was bankrupt (2) or because the house was uninhabitable (2).

This more qualitative analysis sheds further light on the migratory patterns of owner occupiers and private tenants. By highlighting the similarities and contrasts it demonstrates that although there is a considerable overlap in terms of reasons for moving, private tenants appear to be more motivated by 'push' factors such as the unsatisfactory state of the previous home, relationship breakdown, landlord selling the property or wanting to reduce housing costs, whereas in the case of owner occupiers these 'push' factors appear to be of much less importance. This inter-tenure difference must be considered as adding in a small but meaningful way to the evidence that highlights the inter-tenure differences in the patterns and outcomes of household migration.

6.10 Conclusion

The focus of this chapter has been on the relationship between the economic theory underpinning the definition and delineation of functional housing markets that was examined in Chapter 2 of this thesis and the evidence emerging from Northern

Ireland's House Condition Surveys. More specifically, it has attempted to throw light on the extent to which this theoretical platform, which has been built up largely on the basis of assumptions and data relating to the owner occupied sector, was valid for the private rented sector. Chapter 5 of the thesis already provided some evidence of inter-tenure differences between the typical housing circumstances of owner occupiers and private tenants generally – and the socio-demographic and socio-economic profiles that largely determine them – as well as for households who had moved to a new dwelling within the previous year. This chapter has built upon this preliminary evidence base using mainly quantitative techniques to examine more rigorously the key propositions that are bundled together in the theory underlying functional housing markets and that should reflect migratory patterns, motivations and outcomes.

The theoretical proposition that the geographical framework for housing market analysis should be based on functional rather than administrative boundaries was clearly justified and evidenced by the work undertaken by Young *et al.* (2010) in the context of Northern Ireland, mainly on the basis of census data and medical records. It confirmed that administrative boundaries are of little consequence in determining the migratory patterns that formed the basis for Northern Ireland's new HMAs. Not surprisingly, therefore, the analysis of HCS data reveals very high levels of migratory self-containment within the boundaries of these 11 HMAs for both owner occupiers and private tenants. However, the analysis also shows that private tenants typically move considerably shorter distances than owner occupiers although these differences are not statistically significant, partly because of the relatively small subsample sizes, but also because of the disproportionate number of households in both tenures who migrate only very short distances to their new home.

The statistical significance of the inter-tenure differences in migratory patterns based on pre-2015 administrative boundaries, however, suggests that a more granular functionally based geographical framework could be more appropriate for private tenants. Indeed, this point is corroborated by the origin-destination analysis of migrant households who cross HMA borders that indicates that Belfast HMA is more likely to be a destination for private tenants travelling shorter distances from

adjacent HMAs, whereas owner occupiers tend to be moving longer distances out of the Belfast HMA to non-contiguous ones.

These migratory patterns were examined in more detail in conjunction with two socio-demographic variables (age of HRP and household composition) and two socio-economic variables (employment status and household income) that are generally recognised as having an impact on housing choice both in terms of tenure and dwelling characteristics. Despite this more in-depth analysis being hampered to a certain extent by smallish sample sizes, a number of important conclusions emerged.

The initial tenure-neutral cross-tabulations indicated that (with the exception of the relationship between household type the crossing of an HMA boundary) there was little evidence of a statistically significant association between these four variables and the propensity for migrant households to move longer or shorter distances or cross HMA or LGD boundaries. When tenure was introduced as a control variable into this relationship, however, inter-tenure differences did become apparent: the statistical association between migration distance and both age of HRP and household composition was considerably stronger for owner occupiers than for private tenants, while there was very little inter-tenure difference in the case of migration distance and employment status or household income.

The association between crossing an HMA boundary and age of HRP was stronger for private tenants, but stronger for owner occupiers in the case of household type. However, there is little evidence of tenure-related differences in relation to the association between crossing an HMA boundary and employment status or income, although in the case of income the association is stronger for private tenants.

In the case of LGD boundaries, however, a clearer and more consistent picture emerges. It appears that despite the larger subsample of private tenants, the association between moving across an LGD boundary and each of these four variables is much stronger for owner occupiers than for private tenants. This suggests that the housing economics that underpins the theory of functional geographies is generally more relevant to owner occupiers than private tenants.

However, the three-way analyses using age of HRP, household type, employment status and household income as the control variables revealed not only a much more complex picture but also a number of statistically significant associations. In the case of age of HRP, the association between crossing an LGD boundary and tenure is statistically significant for the 25-39 age group and may well reflect the greater ability of owner occupiers on higher incomes in this age group to travel longer distances to purchase their desired home at the right price. In the case of household composition there is a statistically significant association between lone adults and the interaction between tenure and both migration distance and the crossing of an LGD boundary, reflecting the higher propensity of lone adults who are owner occupiers to migrate longer distances, again reflecting the interaction of life course events and purchasing power. This interpretation is supported by the analysis of both employment status and income as control variables in the three-way relationships between tenure on the one hand and migratory distance or the crossing of an LGD boundary on the other. There is a statistically significant relationship in the case of the employment status 'working' with the interaction of tenure and LGD boundaries, with a disproportionate number of working owner occupiers crossing an LGD boundary. Similarly, there is a statistically significant association between lower income households and the interplay of tenure and both migration distance and the crossing of an LGD boundary. Furthermore, lower income households in the private rented sector are disproportionately more likely to travel very short distances and less likely to cross LGD boundaries. Without the specific reasons for moving available for more than two-thirds of the cases it is difficult to be precise about the cause-effect relationships. However, the picture that emerges is one where compared to owner occupiers, private tenants on lower incomes, disproportionately in the 17-24 age group and often lone adults, are more constrained in terms of the distances they are prepared to travel in pursuing their housing choices.

The analysis of patterns of household migration in terms of capital valuation and dwelling size reinforced this picture of inter-tenure differences and more constrained housing choices for private tenants. Not unexpectedly, the analysis of the data showed that owner occupiers typically live in homes with a higher capital value and

enjoyed a much wider range of choice in terms housing quality as reflected in the distribution of data on capital value. The analysis of the three-way relationship between capital value, tenure and age of HRP also revealed a number of statistically significant relationships, in particular the disproportionately high number of private tenants in the 25-39 and 40-59 age groups living in homes in the two lowest capital value bands and conversely a disproportionately high number of owner-occupiers in the two highest bands.

The analysis of the migrant household database also confirmed that there is a much stronger relationship between age of HRP and income for owner occupiers than for private tenants, a finding that is of considerable relevance for understanding migratory patterns that reflect life cycle changes. This was reflected in the fact that there was a statistically significant relationship and strong associated effect between household income and the interplay of tenure and capital value, with owner occupiers in the £30,000 or more income bracket disproportionately occupying homes in the highest capital value band, whereas private tenants with incomes of at least £30,000 disproportionately occupied dwellings in the lowest two capital value bands.

The analysis of dwelling size, not unexpectedly given the strong relationship between it and capital value, resulted in a broadly similar pattern to the one based on capital value. Once again, the inter-tenure differences were most significant in relation to households aged 25-39 and 40-59, and in relation to households with incomes of more than £30,000. This reinforced the conclusion that inter-tenure differences in the profiles of owner occupiers and private tenants in terms of the combination of age of HRP and income have resulted in different housing outcomes in terms of housing choice with regard to capital value and dwelling size.

The analysis of patterns of migration with regard to spatial arbitrage and trading up or down aimed to cast light on two other important aspects of the economic theory underpinning the definition and delineation of HMAs. The examination of the data in relation to spatial arbitrage showed that, despite the considerable inter-tenure differences in the capital values and dwelling sizes of owner occupied and privately rented properties, there was overall a clear inter-tenure consistency for both owner

occupiers and private tenants whose origin and destination tenure and HMA remained unchanged to 'trade constant quality goods' (housing services) in HMAs characterised by the tendency for standardised dwelling prices to approach uniformity. However, this overall pattern was achieved in a somewhat less consistent way in the case of private tenants and, given the apparent insignificance of inter-tenure differences in terms of age of HRP or income, may well simply reflect the greater inconsistency in the relationship between capital value and dwelling size in the private rented sector, but may also indicate inter-tenure differences in the motivations for migration.

The analysis also indicated that there was evidence of inter-tenure differences with regard to trading up or down. Owner occupiers were much more likely to trade up by a much higher percentage in terms of capital value and this was largely a reflection of differences in the migratory behaviour of 25-39 year olds. Income was a significant factor overall in influencing this pattern but could not be linked statistically to any particular income band. However, testing the associated theoretical proposition with regard to the crossing of submarket boundaries in the Belfast HMA proved inconclusive largely due to the very small sample size.

Finally, a more qualitative approach to the evidence in relation to crossing an HMA border and the actual reasons households have moved house highlighted a number of inter-tenure differences. The crossing of an HMA border analysis revealed the disproportionate number of owner occupiers in the 25-39 and 40-59 age groups who crossed an HMA boundary and evidence that indicated that owner occupiers and private tenants had different patterns of migration in relation to movement across the Belfast HMA boundary. The analysis of reasons for moving from the 2009 and 2011 databases indicated that 'push' factors are more important drivers of migration for private tenants than for owner occupiers.

Overall, the analysis of the evidence contained in this chapter suggests a very complex relationship between the socio-demographic and socio-economic factors that underlie and to a large extent determine household migration patterns on the one hand and the migratory outcomes in terms of location and physical attributes of the dwelling on the other. Chapter 7 of this thesis tries to draw these complexities

together in the form of a regression model that will provide a unifying core to the overall study and in doing so provide some indication of the relative strengths of the factors underlying the dynamics and patterns of household migration.

Chapter 7 Modelling the Data – Theoretical Reflections

7.1 Introduction

The analysis presented in the previous chapter aimed to provide an initial yet robust evidence base on which to evaluate the key theoretical propositions associated with the definition and delineation of functionally defined HMAs. The results emerging from the statistical analysis illustrated that there are substantial differences between the typical housing circumstances of migrant households in the owner-occupied and private rented sectors – as well as the combination of socio-demographic and socio-economic factors that largely determine them. The analysis also indicated that a more granular spatial framework could be more appropriate for private tenants and that the economics-based theoretical propositions underpinning the definition and delineation of functional HMAs may be more relevant to owner occupiers than private tenants.

The purpose of this chapter, therefore, is to build upon the detailed analysis of the inter-tenure differences in migratory patterns in terms of geography and choice of dwelling characteristics examined in Chapter 6. Accordingly, the analysis revisits a number of the theoretical components with the aid of logistic regression models that focus on the more significant variables and associations emerging from analysis of the migrant household database with the aim of providing further insights into the differential migration patterns of owner occupiers and private tenants. This approach provides a relatively simple vehicle for reflecting on the theoretical postulations emerging from a range of academic contributions examined in Chapter 2. Figure 7.1 places Chapter 7 in its overall structural context.

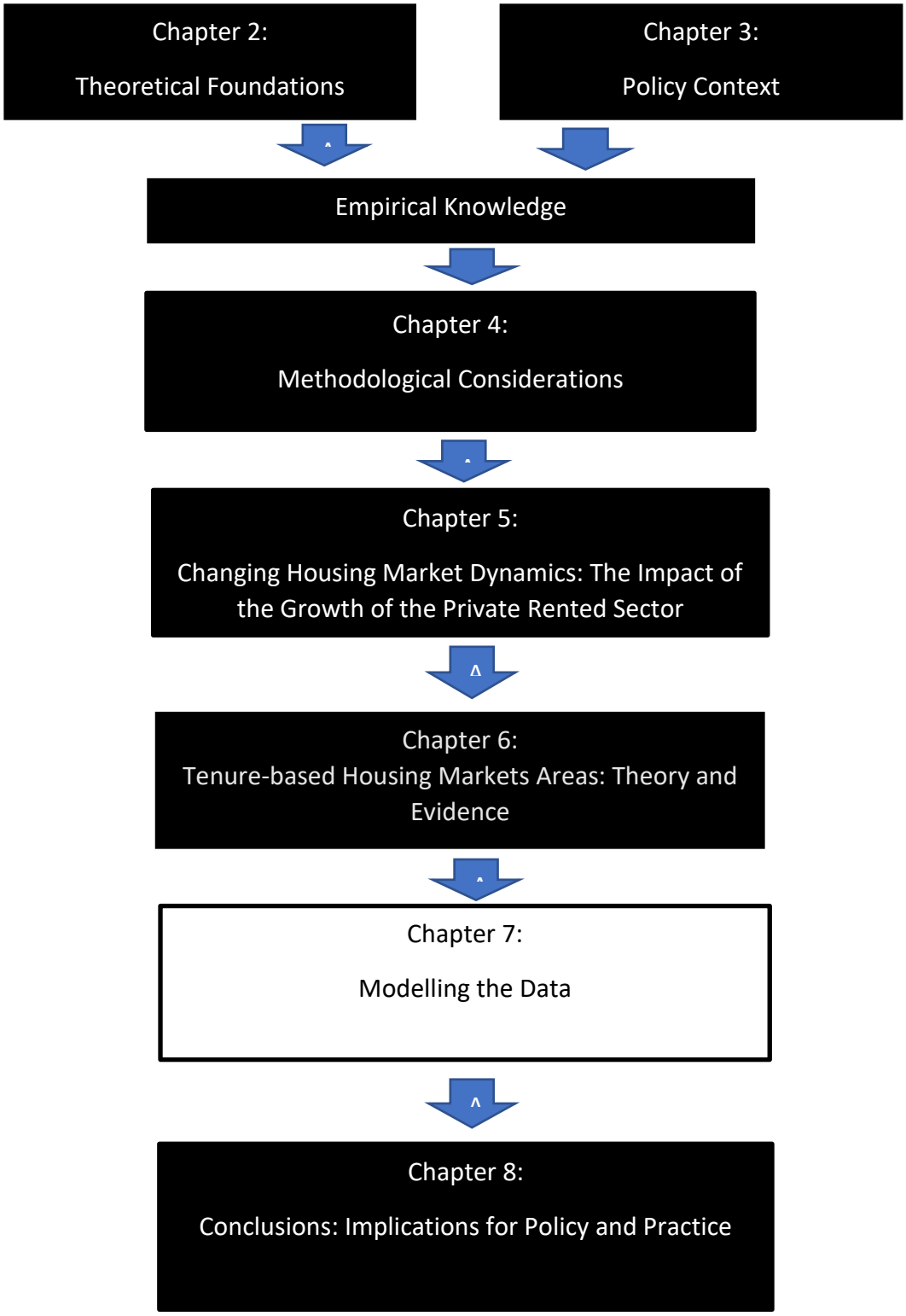

Figure 7-1: Chapter 7 in its structural context

A number of potential regression models were explored on the basis of two key criteria. Firstly, their ability to provide evidence that could be considered directly relevant to the focus of the thesis, namely the spatial framework for housing market analysis and the theoretical propositions on which this is based and, secondly, the actual data in terms of sample size and strength of effects that emerged from the analysis in Chapter 6 and a series of preliminary modelling attempts. As noted in Chapter 6, sample adequacy in some cases required transformation and recategorisation of the data. Within the modelling approach adopted in this chapter too, there are also a small number of additional adjustments made to the format of the data[68] to ensure that in as far as possible the models produced statistics and results that are both reliable and valid. The final design of the models was also guided by the advice from Field (2013) that such models should strive for parsimony – including only variables considered to provide some 'explanatory benefit' (effects). The binary logistic regression models presented are based on 260 cases and use both key socio-demographic and socio-economic variables and capital value to examine, firstly, inter-tenure differences between households in the private rented sector and those in the owner-occupied sector and, secondly, the propensity of migrant households to cross LGD boundaries.

Accordingly, the first logistic model (Section 7.2) examines tenure as the dichotomous dependent variable; the second model (Section 7.3) uses crossing an LGD boundary (or not) as the dichotomous dependent variable. Each of the variables in the equations underpinning the models have associated regression coefficients that indicate a change in log odds (or *logits*) as a function of change in predictor variables (covariates). A positive value indicates that as scores increase, the probability of falling into a target group (an 'event' such as belonging to the private rented sector or crossing an LGD boundary) increases. Conversely, a negative coefficient indicates that the 'event' is less likely at the level of the predictor variable

[68] For example, the age of HRP category 75 years or older proved to have too few cases (3 in total) to enable the logistic regression to provide meaningful statistics in relation to this variable. This category was therefore combined with the 60-74 age group.

compared to the reference category. Section 7.3 links the results of the models to theoretical issues and 7.4 draws conclusions.

7.2 Logistic Regression Analysis: Inter-tenure Differences

Initial testing of the tenure based logistic model form and structure revealed that the inclusion of the household composition predictor presented singularity issues and model complexity challenges that detracted from the relevance of the model[69]. As a consequence, the tenure based model was re-specified and applied the age of HRP (four bands), household income (three bands), a transformed binary variable relating to employment status (in employment or not), crossing of an LGD boundary (or not) and capital value of current property (three bands) as covariates. The Omnibus Test for Model Coefficients for the tenure based model indicates a significant improvement over the baseline intercept-only (null) model (χ^2 = 94.057, p =.000), thereby indicating that the explanatory variables enhance the predictive nature of the marginal probabilities for the outcome categories. Given that for logistic regression models it not possible to compute the R^2 statistic equivalent to OLS regression, three approximations are computed and set out in the Model Summary. The most reported of these is the Nagelkerke pseudo R^2 value[70] (41.8%), which indicates that the covariates explain a relatively adequate proportion of the variation between the two tenures. The Hosmer and Lemeshow test is statistically insignificant (χ^2 = 10.938, p =.205), illustrating that the model is indicative of a good fitting model. In terms of group membership, the Classification Table for the tenure model illustrates a 77.7% classification accuracy for the sample in relation to the predicted tenure groupings[71].

As evidenced in Table 7.1, the parameter estimates, the Wald[72] test and associated p-value estimates contained in the Variables in the Equation table reveal the

[69] This was largely due to the eight-fold classification and the small cell sizes that result. Unfortunately, in this case it is not possible to combine these categories in any meaningful way that doesn't effectively repeat the age of HRP variable.

[70] Ranges from 0-1. The *pseudo* nature means that these do not explain proportion of variation in the DV accounted for by the predictors.

[71] The initial tests exhibit that the significant Chi-Square (intercept only) prediction model fits the data better than a null model (non-predictors), revealing a statistically significant improvement in fit with the addition of the characteristic coefficients with the Classification table.

[72] The Wald statistic is the z^2 chi-squared distribution.

individual influence of each explanatory variable in the context of the model, with the predicted changes in log-odds for every unitary change in the predictor variables illustrated by the beta coefficient. The household income bands both display positive coefficients. The associated odds ratios (exponential of beta), display a statistically significant coefficient for household income band (1) suggesting that (compared to households in the £30,000 plus income bracket – the reference category) households within this lowest income grouping (< £15,000) are almost 4 times as likely to reside in the private rented sector. This odds ratio effect, however, not unexpectedly decreases when examining the income band (2) coefficient, which whilst remaining positive suggests that households within this income category (£15,000-£29,999) are only 1.4 times more likely to reside in the PRS (compared to households in the upper income bracket) – however, this is only significant at the 10% level.

In terms of the age of HRP groups, the findings also display positive statistically significant coefficients at the 5% level. Households with an HRP aged between 17-24, are 6.3 times more likely to live in the private rented sector than households in the oldest age bracket (60 and above). The comparable figures for the 25-39 age group show that it is 5 times more likely to live in the private rented sector, whilst the 40-59 age group is 4 times more likely to live in the private rented sector.

The findings for employment status (Table 7.1) show that there is a negative statistically significant association between tenure and employment status ($\beta = -1.56$, $p < .000$). In terms of magnitude, the odds ratio value of 0.210 infers that households who are not in employment are almost 80% more likely to be in the private rented sector than in the owner-occupied sector. When considering the of crossing of an LGD boundary, the odds ratio indicates that if a household does not cross an LGD boundary it is 2.6 times more likely to be in the private rented sector ($p = .004$).

In the case of capital value, the results demonstrate a clear pattern that is related to propensity to live in the private rented sector. In the case of households living in dwellings in the lowest capital value band (£25,000-£69,500) the odds ratio shows that they are 4.3 times more likely to be private tenants compared to households living in the highest band (£130,000 plus) – a figure that is statistically significant at

the 1% level. The odds ratio effect declines in the case of the next two capital value bands (2) and (3), which equate to £70,000-89,500 and £90,000-109,500. In the case of the fourth highest banding, however, there is a negative coefficient value with an odds ratio of .685, suggesting that households living in homes in band (4) (£110,000-£129,500) are almost 30 per cent less likely to live in the private rented sector than those in the highest capital value band.

Table 7-1: Predicting Tenure: Odds ratio coefficients

Variables	β	S.E.	Wald	Exp(β)
HH Income Band (1)	1.355	0.512	6.452***	3.877
HH Income Band (2)	0.367	0.438	6.057**	1.443
Age of HRP Groups (1)	1.844	0.726	6.452**	6.323
Age of HRP Groups (2)	1.605	0.652	6.057**	4.979
Age of HRP Groups (3)	1.382	0.663	4.343**	3.981
Employment Status	-1.561	0.445	12.314***	0.210
Cross LGD Boundary	0.946	0.369	6.573***	2.576
Capital Value Band (1)	1.459	0.507	8.281***	4.303
Capital Value Band (2)	0.911	0.492	3.426	2.488
Capital Value Band (3)	0.826	0.522	2.502	2.283
Capital Value Band (4)	-0.378	0.623	0.367	0.685
Constant	-1.895	0.769	6.068**	0.150

***denotes significance at the 1% level; **5% level; *10% level

7.3 Logistic Regression Analysis: Crossing LGD Boundaries

The second model investigates the migration movements using the crossing of an LGD boundary as the dichotomous dependent variable (Table 7.2) and utilises age of HRP, household income, capital value of current property and tenure as covariates. The Omnibus Test for Model Coefficients shows improvement on the null model (χ^2 = 17.797, p = .086), with the pseudo R^2 statistics in the model showing a Nagelkerke value of 10.0%, indicating that the model's overall explanatory value in terms of whether an LGD boundary is crossed is much lower than the tenure based model. In terms of model fit, the Hosmer and Lemeshow test is statistically insignificant (χ^2 = 5.740, p = 0.676) signifying the model fit is acceptable with the Classification Table displaying a 76.2% classification accuracy for the sample in relation to the predicted groupings.

The results for this model, not unexpectedly given the analysis presented in Chapter 6, show somewhat different outcomes to the first tenure based model. In the case of employment status, the beta value is positive (0.031) and although statistically insignificant provides an odds ratio of 1.032 indicating that this only has a very minor (3%) impact on the propensity to cross an LGD boundary. It reinforces the analysis contained in Chapter 6, section 6.6.3 of this thesis that, although there appears to be an overall relationship between employment status and the propensity to cross an LGD boundary, this is largely reflective of the dominance of owner occupiers in the 'working' category rather than the influence of employment status *per se*.

Indeed, this interpretation is confirmed by this migration based model in revealing a positive statistically significant relationship at the 5% level between tenure and propensity to cross an LGD boundary. The model confirms the importance of the effect of tenure, suggesting that owner occupiers are 2.5 times more likely to cross an LGD boundary and, conversely, indicating that migrant households remaining within LGD boundaries are more likely to be private renters (Table 7.2).

Table 7-2: Predicting crossing an LGD boundary: Odds ratio coefficients

Variables	β	S.E.	Wald	Exp(β)
Employment Status	0.031	0.405	0.006	1.032
Tenure	0.935	0.366	6.538***	2.548
HH Income Band (1)	-0.395	0.539	0.537	0.674
HH Income Band (2)	-0.452	0.462	0.958	0.636
Age of HRP Groups (1)	-0.365	0.629	0.338	0.694
Age of HRP Groups (2)	-0.686	0.582	1.386	0.504
Age of HRP Groups (3)	-0.547	0.591	0.854	0.579
Capital Value Band (1)	0.339	0.559	0.368	1.404
Capital Value Band (2)	0.806	0.553	2.285	2.239
Capital Value Band (3)	1.253	0.540	5.392**	3.502
Capital Value Band (4)	0.561	0.637	0.776	1.753
Constant	-1.272	0.749	2.885*	0.280

***denotes significance at the 1% level; **5% level; *10% level**.**

In the case of household income, the beta coefficient values for both the lowest and middle income bands are both negative. The odds ratios, therefore, indicate that households in either of these two income bands are approximately 35% less likely to cross an LGD boundary compared to households in the highest income bands, although these figures are not statistically significant. Similarly, in the case of age of

HRP, the beta coefficient values for each of the three age groups are negative. In comparison to household income, however, the odds ratios are more differentiated and show, for example, that households in the 25-39 age group are approximately 50% less likely to cross an LGD boundary compared to the 60 plus age category. However, again, the Wald statistics and coefficients are insignificant.

The statistics in relation to capital value bands, on the other hand, provide some evidence of statistical significance. For each of the four capital value bands, the beta coefficient values are positive with the odds ratio indicating that households in these four lower capital value bands are more likely to cross an LGD boundary than a household living in a home with a capital value of £130,000 or more. The variation in the odds ratios may to a certain extent be explained by the association between capital value and tenure. However, the greater propensity of households living in homes with a lower capital value to cross an LGD boundary may also reflect the fact that households living in the highest capital band are more likely to be in the higher income band and have reached a life cycle stage where their ascent (or sideways move) on the property ladder no longer necessitates travelling longer distances to find a suitable property. The highest odds ratio, and only capital value range which is statistically significant, is for the middle capital value band (£90,000-£109,500) and indicates that households living in dwellings in this band are 3.5 times more likely to cross an LGD boundary than households living in a home in the highest capital band – perhaps reflecting a combination of age of HRP, increasing incomes and life cycle changes that encourage a longer distance move to find a suitable home. This also undoubtedly reflects first-time buyer activity in Northern Ireland, when in the mid-2000s many first-time buyers moved outside the boundaries of Belfast City Council to find a suitable (affordable) property.

7.4 Theoretical Reflections

The analysis encapsulated in the logistic modelling clearly resonates with much of the academic literature on housing market analysis examined in Chapter 2 of this thesis. Murie *et al*. (1976) emphasise the interdependence of different sectors of the housing system and the analytical importance of migration in understanding their connectivity, but also the importance of tenure as the primary method of analytical

disaggregation. Ferrari (2011), likewise appreciates the importance of understanding inter-tenure relationships and, noting that much of the analytical work has tended to focus on the owner-occupied sector, stressed the need to examine other tenures in terms of their inter-relationships. Indeed, this touches upon the crux of the matter, because the requirement for tenure specific analysis of the housing market has only become stronger given the rise of the private rented sector over the past decade. However, such analysis poses a challenge, primarily due to the scarcity of sufficiently large household level datasets where a reliable tenure is included, making it difficult to analyse inter-tenure differences in migratory patterns to the extent required for meaningful conclusions.

The analysis presented in the foregoing sections above have addressed this to some extent, given the data limitations, by comparing and contrasting a number of socio-economic and socio-demographic variables in an interactive and inter-related way. This arguably provides a basis for showing not only differences in individual characteristics of living in the private rented sector compared to owner occupancy, but also how these variables interact in the real world to have a major impact on the propensity for households to live in owner occupancy or in the private rented sector.

The second logistic model that utilised a dichotomous variable indicating whether a migrant household had crossed an LGD boundary clearly demonstrated that 'geography matters', but that this is not a straightforward relationship. The academic and policy literature reviewed in Chapter 2 provided a cogent justification for the premise that HMAs are best defined on the basis of functional boundaries that use migratory patterns as the basis for delineation rather than administrative ones (Jones and Watkins, 1999; Brown and Hincks, 2008; Hincks and Baker, 2012). However, the findings demonstrate that the boundaries defined and delineated essentially on the basis of applying concepts and self-containment criteria to the movements of owner occupiers may not be that appropriate for private tenants. The tenure model that included crossing an LGD as a co-variate clearly highlighted the statistically significant difference in the propensity of owner occupiers and private tenants to cross an LGD boundary. The LGD boundary was chosen as a compromise between distance *per se,* which was seen as a somewhat crude indicator, and crossing an HMA boundary –

which, as was clear from earlier analysis (Chapter 6) – was effectively meaningless because private tenants were considerably more likely to migrate shorter distances. The strength of the relationship between tenure and propensity to cross an LGD boundary was confirmed by the migration based model.

It has to be emphasised that this is not in any way suggesting that LGD boundaries are more suitable for housing market analysis of the migratory patterns of private tenants, but merely that LGD boundaries are on a scale that may well be more appropriate for comparing and contrasting inter-tenure differences in migration patterns in terms of their geography. This is particularly the case in the LGDs outside the Belfast HMA, where settlement patterns tend to be characterised by a dominant town with a more rural hinterland and bear a considerable resemblance to the 'local' HMAs postulated by Jones *et al*. (2012) in contrast to both the higher level 'framework' HMAs or the more granular submarkets, a position that is echoed in the upper and lower tier HMAs postulated by Hincks and Baker (2012).

The second LGD boundary-based model also illustrates that the relationship between tenure and propensity to cross an LGD boundary is not by any means a straightforward relationship in the real world. The model illustrates that this relationship is tied into a complex interaction of socio-economic and socio-demographic variables, and (as Chapter 6 illustrated) it is only when certain sub-categories of these variables operate in combination that they have a statistically significant influence on the propensity to cross boundaries (or not), and, furthermore, that this complex web is significantly different for owner occupiers and private tenants.

This analysis clearly resonates with the work of Jones and Coombes (2013) in terms of recognising the important differences in the socio-economic and socio-demographic profiles of owner-occupiers and private tenants and, although Jones and Coombes (2013) do not specifically mention it, the inter-tenure differences in housing circumstances that interact with these profiles to influence migration patterns. The findings evident in the tenure based model also highlight the statistically significant influence that age of HRP has on the propensity to live in the

private rented sector and reflects the important role played by life-cycle in understanding the housing choices, opportunities and constraints that are reflected in the migratory patterns that shape HMA and submarket boundaries (Clark and Huang, 2003; Jones *et al*. 2012, Hincks and Baker, 2012).

The findings also throw light on another key aspect of the theoretical propositions underpinning the delineation of HMAs – spatial arbitrage. The model provides a strong evidence base to support the seminal work of Maclennan (1982) and Gibb (2003) in particular, who were clear that housing market complexity reflected the complex nature of housing as a commodity, as well as the complexity of the inter-related factors that determine household migration. It is the complexity of this interaction that makes it very difficult to distil tenure-based causal relationships from the statistical analysis produced within the findings. However, there is sufficient evidence that resonates with the position postulated by Jones and Coombes (2013) that the concepts of spatial arbitrage do apply to both owner occupiers and private tenants, but that the HMAs that are defined on the basis of this essentially economic concept apply to two at different geographical scales. In other words, in terms of spatial arbitrage, there are two separate housing markets that operate on the basis of two different geographies but are interlinked in one overall housing system by inter-tenure movements.

7.5 Conclusion

Above all, three key findings have emerged from the statistical modelling undertaken in this chapter in conjunction with the analysis contained in Chapter 6. Firstly, that understanding the effect of tenure on the spatial dynamics of household migration is of considerable importance. Secondly, that tenure interacts with a number of key socio-demographic and socio-economic factors that typically differentiate private tenants and owner occupiers and are reflected in different housing circumstances to determine the underlying motivations and patterns of household migration in both the owner occupied and private rented sectors. Thirdly, that these interrelationships operate in a very complex manner that demands the analysis of large consistent datasets with a range of socio-economic and socio-demographic variables, dwelling characteristics and locational data that is not readily available – as well as more

qualitative data that provides deeper insights into the detail of motivations – a conclusion that echoes the position of Watkins (2008). The next, concluding chapter of this thesis returns to these themes in the context of the overall findings of the thesis and the implications for policy and practice.

Chapter 8 Conclusion and Policy Implications

The underlying motivation for this thesis is improving the quality and usefulness of the evidence base for housing market analysis and planning for housing supply in Northern Ireland. The thesis explores the impact of the major structural change in Northern Ireland's housing market – the rapid growth of the private rented sector – since the turn of the 21st century on the definition and delineation of the spatial framework that provides the basis for both analysis and prognosis. It examines how theoretical propositions grounded in the field of housing economics have to a greater or lesser extent guided policy and practice in relation to determining the boundaries of HMAs and submarkets in the context of England and Scotland compared to Northern Ireland, where the responsibility for planning for housing is spread across a range of Government departments and public sector bodies. It argues that a consistent application of a methodology that reflects the economics based theory underpinning the definition and delineation of functional HMAs and submarkets would result in more robust outcomes in terms of assessing future housing requirements and supply, but that this also should reflect the analytical consequences of the structural changes in Northern Ireland's housing market.

The study has had the following overarching aim: *To critically examine the methodologies used by Government to plan for future housing supply in Northern Ireland – specifically its approach to Housing Market Analysis – in the context of economic uncertainty and the growth of the private rented sector.* In order to achieve this the thesis has been guided by five key objectives and was undertaken in the context of a post-postivist research paradigm that recognises an objective reality, but also a degree of complexity in the real world (in this case in the dynamics of the housing market) that makes it difficult to fully understand underlying inter-relationships and causal connections. The thesis utilises a mixed methods research design that combines mainly quantitative techniques with some more qualitative data to elicit deeper insights into the process of process of household migration.

This final chapter concludes the thesis by evaluating the key findings that have emerged in the light of each of the five inter-linked objectives. This evaluation

provides the basis for the most important conclusions that in turn inform policy and practice, including recommendations on additional research requirements.

8.1 Research objectives revisited: Key findings

1. *To evaluate the theoretical framework for Housing Market Analysis in the light of significant changes in the structure of Northern Ireland's housing market.*

This objective was addressed primarily in Chapter 2. The chapter began by examining the key economics-based theories that effectively provide a number of important insights into the triangular relationship between residential location, migration and employment that lies at the heart of the theoretical framework underpinning the definition and delineation of HMAs.

The neo-classical access-space models focusing on the trade-off between residential location and the journey to work constitute the ultimate economic foundation for functionally defined housing markets. The evaluation of the access-space model revealed its sensitivity to the assumptions underpinning it, in particular the assumption of an essentially monocentric spatial structure that bears little resemblance to the reality of most modern cities as well as the difficulty it has in explaining urban structures that are to a considerable extent the outcome of path dependency. Nevertheless, the model's focus on the distance decay curve and its contribution to understanding the process of suburbanisation illustrate its relevance to conceptualisation of functional housing markets.

Filtering models that recognise the segmented nature of housing markets and are characterised by varying degrees of disequilibrium and focus on the household migration patterns that connect them have also made an important contribution to the theory underlying functional housing markets. This model has attracted criticism for its assumptions on consumer behaviour, its lack of definitional clarity and for downplaying the role of land use planning. However, its emphasis on the triangular relationship between dwellings, households and migratory flows provide a key

component of the theoretical foundations of housing market analysis and in particular the concept of submarkets.

Hedonic modelling has played an important role in housing market analysis, and in particular in the identification of submarkets. The academic literature reveals little academic disagreement in relation to the concept of hedonic modelling and the regression-based approach to calculate the implicit price of individual dwelling attributes. However, the detail has attracted criticism, including its theoretical assumptions of market equilibrium and perfect information on the part of buyers, as well as more practical issues such as a reliance on readily available data that can lead to misspecification and insufficient attention to attribute quality. Nevertheless, it is clear that skilful hedonic modelling provides a robust and pragmatic approach to identifying housing submarkets that can be enhanced by utilising qualitative data from estate agents and other key actors.

Finally, the chapter examined the contribution of housing market simulation models that recognise the complexity of housing systems framework and can provide valuable insights into the dynamics of the market in the shorter term and the potential policy impact of policy interventions. The resources required to regularly update the models and model complexity have attracted criticisms from Government policy makers. Nevertheless, simulation models continue to make a significant contribution to the policy debate surrounding planning for housing supply.

This multi-dimensional theoretical framework provided the basis for a more detailed examination of the academic literature on housing market analysis, and specifically the definition and delineation of housing markets and the economic concepts that underpin them. It highlighted the importance of recognising a housing market as a system of interdependent parts connected by household migration. The literature that focuses more specifically on the definition and delineation of HMAs is consistent in its view that administrative boundaries are an inappropriate framework for housing market analysis and presents a cogent argument to justify the spatial framework ultimately defined on the basis the economic concepts of ‘spatial arbitrage’ and ‘substitutabilty’, and delineated on the basis of household migration patterns. Much of the discursive analysis focuses on the actual process of delineating

HMAs and housing submarkets that reflects data availability, the inherent complexity and 'variegated' nature of the housing market, and a certain lack of conceptual and definitional clarity. This is reflected in some more recent academic contributions to the debate which attempt to address these challenges in a way that results in a definitional blurring between HMAs and housing submarkets and an increasingly complex tiered approach that must be considered to militate against a more practical application of a functionally-defined spatial framework of housing markets and submarkets.

2. *To evaluate the policy context and current spatial framework for estimating future housing requirements and supply in Northern Ireland in the light of the changing tenure composition of the housing market.*

This objective was addressed primarily in Chapter 3 by means of a detailed examination of the policy literature and a number of associated academic studies that have underpinned Government guidance in the UK on housing market analysis. It briefly outlined the rise of evidence-based policy and planning and the growing emphasis placed by Government on market solutions to meeting future housing requirements that necessitate incorporating economic theory into an analytical process traditionally dominated by demographic analysis.

The transition from housing needs assessment that was designed to guide the supply of social housing to a much more comprehensive analysis of the housing market that recognised the importance of inter-tenure connections emerged first in Scotland (Local Housing Systems Analysis) in the late 1990s. The exemplary ground-breaking guidance published by Communities Scotland in 2004 provided local authorities with a detailed methodology on undertaking housing market analysis based on a geographical framework of HMAs that continues to guide the methodological approach to planning for housing in Scotland.

In England, the transition began to take shape following a major reform of the planning system in 2004 that required the development of 'Regional Spatial Strategies' based on a more rounded, integrated approach to housing market analysis and planning for housing that recognised the importance of 'market signals'

and the need for planning authorities to work across boundaries in a more collaborative manner. Detailed methodological guidance was published by the DCLG the following year and emphasised the importance of a shared evidence base on housing need and demand that would be provided by a Strategic Housing Market Assessment. As in Scotland, the geographical framework for these strategic assessments was to be functional HMAs. However, in contrast to Scotland, Government guidance in England was criticised for a lack of clarity in relation to the utilisation of key data sources, leading to ambiguity in the practical application of the recommended HMA framework and consequently reputational damage to Strategic Housing Market Assessments.

Following the abolition of the strategic regional planning by the newly elected Conservative-led Government in 2010, a new National Planning Policy Framework was introduced with the aim of accelerating the planning for housing process facilitated by a 'presumption in favour of sustainable development', and emphasising the need to take account of market signals, but also reinforced the need to undertake SHMAs and collaborate with other local authorities where necessary HMAs cross boundaries. The SHMA process in England, however, has been the subject of considerable criticism highlighting both conceptual and methodological weaknesses, not least the fact that the majority of local authorities were still using a spatial framework that reflected administrative and political convenience rather than functional boundaries. Despite attempts to develop a consistent HMA geography for England a combination of lack of definitional clarity and complexity resulted in a decline in interest among policy makers and practitioners. New Government guidance for England in 2015 still required local authorities to use functionally defined HMAs as basic analytical framework, but the guidance lacked the required level of detail and reference to an agreed spatial framework. The result was an even greater level of inconsistency that often resulted in lengthy, complex debates in examinations in public dealing with planning applications for new homes. Government proposals in 2017 that were enshrined in regulations in 2018 to address this issue by means of a simplified standardised approach based on central government estimates of household growth and local estimates of affordability

appears to herald a retreat from the use of functional HMAs as the geographical framework for assessing future housing requirements, and suggests a deepening contrast with the position in Scotland where policy and practice continues to be based on a framework of functional HMAs.

The transition from housing needs assessment to housing market analysis in Northern Ireland began somewhat later than in England and has been characterised by a policy and practice disconnect that is undoubtedly partially attributable to the disparate nature of responsibility for planning for housing in Northern Ireland. The publication of Northern Ireland's Regional Development Strategy marked a significant step forward in terms of providing an overarching planning framework that recognised the importance of the relationship between economic prosperity and planning for housing. However, the analysis of future housing requirements that underpinned the Housing Growth Indicators contained in the Regional Development Strategy drew on analysis that was essentially based on administrative (LGD) boundaries. A report published by the Housing Executive in 2010, in its strategic housing role, attempted to address this by providing a consistent set of 11 functional HMAs for Northern Ireland.

However, despite this the Department for Regional Development continued to use administrative boundaries as the basis for estimating future housing requirements both for the HGIs in its updated Regional Development Strategy published in 2012 and the associated updated 2012-based and 2016 based Housing Growth Indicators. The transfer of responsibility of most planning powers to the 11 new LGDs in 2015 provided a further opportunity to enshrine the use of functional HMAs in Northern Ireland that would in addition encourage and facilitate a more collaborative approach to planning for housing in Northern Ireland. It is disappointing, however, that the initial draft development plans currently emerging from the 11 local authorities show no evidence of this happening.

In 2018, the Housing Executive published the findings of a new analysis that marginally changed the HMA framework of 2010 and continues to provide analysis based on this to the Councils. This lends credence to the hope that at some stage a future Regional Development Strategy and the Local Development Plans will

transition to the use of functional HMAs as the basis for estimating Northern Ireland's future housing requirements.

Notwithstanding this policy and practice disconnect in Northern Ireland, and the significantly different levels of commitment to functionally defined HMAs in England and Scotland, what clearly emerged from the review of the policy literature was that changes to the structure of the housing market that have arisen as a result of the rapid growth of the private rented sector were not being taken into consideration when developing the spatial framework for housing market analysis in any of the three jurisdictions.

3. *To explore how the socio-demographic and socio-economic characteristics and housing circumstances of migrant households impact on the household migration patterns that underlie the delineation of functional housing markets.*

This objective was addressed in Chapters 5, 6 and 7 on the basis of an analysis of House Condition Survey and Valuation List data using mainly quantitative, but also some more qualitative data. Building on the mainly descriptive analysis contained in Chapter 5, Chapter 6, using for the most part inferential statistics provided substantial evidence to illustrate the important inter-tenure differences in the socio-demographic and socio-economic profiles of migrant households and in their respective housing circumstances. The household composition of migrant households in the owner-occupied sector was much more likely to comprise two adults or small families, compared to lone adults or lone parents in the private rented sector. Migrant households with a young HRP (17-24) are much more commonly found in the private rented sector, while those with older HRPs (60 and over) are dominant in the owner-occupied sector. Likewise, there were considerable inter-tenure disparities in terms of household income and employment status with much higher proportions of private tenants on low incomes and in the 'not working' category and, conversely, much higher proportions of owner occupiers were in employment and on higher incomes. These disparities were reflected in the housing circumstances encapsulated in capital value that showed private tenants much more

likely to live in homes at the lower end of the capital value scale compared to owner occupiers who dominated the upper end.

Chapter 6 also used a combination of descriptive and inferential statistics to focus on the differential migratory patterns that could be expected to arise as a result of these inter-tenure differences in socio-demographic and socio-economic profiles and housing circumstances. An initial exploration of inter-tenure differences in migratory patterns revealed the predominance of very short moves for both tenures that meant the tendency for private tenants to migrate shorter differences did not emerge as statistically significant. However, statistical significance of the inter-tenure differences in migratory patterns based on pre-2015 administrative boundaries indicated a more granular functionally based geographical framework could be more appropriate for private tenants, an observation that is supported by the origin-destination analysis of migrant households who cross HMA borders. The analysis also indicated that while self-containment is a valid concept for analysing the migratory patterns of private tenants, it needs to be carried out on a significantly smaller scale than the current HMA framework.

The analysis of these geographical patterns of migration in combination with two socio-demographic variables (age of HRP and household composition) and two socio-economic variables (employment status and household income) resulted in a number of important conclusions, despite the relatively small subsample sizes. Initial tenure-neutral cross-tabulations provided little evidence of statistically significant associations between these four variables and the propensity for migrant households to move longer or shorter distances or cross HMA or LGD boundaries. However, when tenure was added as a control variable, inter-tenure differences did become apparent. This was particularly evident when analysis was based on the pre-2015 LGD boundaries that were considered to provide a more appropriate scale for HMA boundaries based on the migration patterns of private tenants. It revealed that the association between moving across an LGD boundary and each of the four key variables is much stronger for owner occupiers than for private tenants, suggesting that the economics based propositions underpinning the definition and delineation

of functional geographies is of more relevance to owner occupiers than private tenants.

However, the three-way analyses using age of HRP, household type, employment status and household income as the control variables clearly demonstrated an unexpectedly complex picture of the association between the interaction of socio-economic and socio-demographic variables on the one hand and the outworking of these factors in combination with the housing circumstances and aspirations of owner occupiers compared to private tenants. The evidence of this complexity was reinforced the outcomes of the two binary logistic regression models presented in Chapter 7. However, the somewhat blurred image that emerged was one of private tenants on lower incomes, disproportionately in the 17-24 age group and often lone adults, who are significantly more constrained in terms of the distances they are prepared to travel in pursuing housing outcomes. The analysis of patterns of household migration in terms of capital valuation and dwelling size reinforced this picture of inter-tenure differences and more constrained housing choices for private tenants.

4. *To examine the extent to which the theoretical foundations of functional housing markets* (*spatial arbitrage and migration self-containment*) *are applicable to the private rented sector.*

The analysis of patterns of migration with regard to spatial arbitrage (substitutability) in Chapter 6 showed that, despite the considerable inter-tenure differences in the capital values and dwelling sizes of owner occupied and privately rented properties, there was overall a clear inter-tenure consistency for both owner occupiers and private tenants whose origin and destination tenure and HMA remained unchanged to 'trade constant quality goods' (housing services) within geographical areas where standardised prices tend to uniformity (HMAs). However, this overall pattern was achieved in a somewhat less consistent way in the case of private tenants and, given the apparent insignificance of inter-tenure differences in spatial arbitration in terms of age of HRP or income, may merely reflect a greater inconsistency in the

relationship between capital value and dwelling size in the private rented sector, but also suggest inter-tenure differences in the motivation for migration.

The more qualitative analysis cast more light on this issue by highlighting the inter-tenure differences in the actual reasons for households moving house. An analysis of migrant households who had crossed an HMA boundary had already revealed differential movement patterns in relation to the Belfast HMA. This inter-tenure difference was compounded by evidence suggesting that 'push' factors such as sub-standard housing or landlord bankruptcy are more important drivers of migration for private tenants than for owner occupiers.

The issue of self-containment was partially addressed above as part of the key findings in relation to Objective 3. The second model presented in Chapter 7 confirmed the more detailed findings that emerged in Chapter 6 to show that if boundaries were drawn at an appropriate scale (in this case using LGD boundaries for illustrative purposes) there were significant differences in the propensity of for owner occupiers and private tenants to cross these boundaries. This led to the important conclusion that although there was evidence to support the concept of spatial arbitrage at work in both tenures, the scale at which this operated – and therefore the geography of migration self-containment – was significantly different for owner occupiers and private tenants.

5. *To explore the extent to which patterns of housing choice and household migration patterns are different for owner-occupiers and private tenants in the context of Northern Ireland and whether such differences are sufficient to challenge theory and practice in relation to the definition and delineation of the spatial framework for Housing Market Analysis.*

In addressing this objective the thesis has to exercise a significant degree of judgment based on a combination of the evidence base that has emerged from this study and personal experience over many years in analysing Northern Ireland's housing market and direct involvement in the planning for housing supply process. The answer in relation to the theory underpinning the definition and delineation of functional HMAs is more straightforward. Despite the limitations of the quantitative analysis

based on a relatively small number of cases, bearing in mind the range of data involved and in combination with qualitative data, there is sufficient evidence to indicate that the patterns of migration are substantially different for owner occupiers and private tenants in terms of geography, choice and motivation. This in no way invalidates the underlying economic based theory that underpins the definition of HMAs on the basis that it does not apply to private tenants. On the contrary, there is sufficient evidence to show that private tenants do trade constant quality goods and operate on the basis of substitutability that is the hallmark of spatial arbitrage and functionally defined HMAs. There is also sufficient evidence to suggest that due largely to a number of inter-related of socio-economic and socio-demographic factors combined with the 'push' factors that appear to be much more influential for private tenants the process of spatial arbitrage plays out in the private rented sector a more inconsistent way within the confines of a smaller arena compared to owner occupiers.

The extent to which these inter-tenure differences should be reflected in practice is challenging and must reflect practical realities – in particular, the current availability and quality of appropriate datasets and the resources available to Government to collect and analyse them. At this stage housing market analysis needs to focus on gathering larger, appropriately designed datasets that will enable more robust tenure-specific analysis to be undertaken. In many ways the response to this key objective of the thesis echoes the conclusions of Jones and Coombes (2013), who argue that there is a case for tenure-specific housing market analysis in the context of major urban areas and where there are known concentrations of private tenants in the HMA.

8.2 Overall Conclusions and Recommendations

There are essentially three main overall conclusions that emerge from this study and in turn inform a number of policy and practice recommendations.

1. The combination of geography and tenure is important in terms of the delineation of an optimal spatial framework for housing market analysis. There is sufficient evidence to demonstrate that analysis and prognosis based on functional

geographies is generally superior compared to one based on administrative boundaries. There are also clear indications that the spatial expression of the migration decisions of private tenants is significantly different from the geography of migration undertaken by owner occupiers.

2. There is also sufficient evidence to support the contention that these inter-tenure differences unfold in response to significant differences in the socio-economic and socio-demographic profiles and housing circumstances (including security/insecurity of tenure) of private tenants compared to owner occupiers. However, understanding the complexities of the interaction and the relative importance of the underlying factors at work requires larger datasets combined with more in-depth qualitative research.

3. There is no evidence to suggest that the economics based theoretical propositions underpinning the housing market analysis of HMAs and submarkets do not apply to private tenants. However, there are clear indications that these play out at a significantly smaller scale and in a more convoluted manner in the case of private tenants whose housing horizons are more constrained by their socio-economic profiles.

There are three main recommendations flowing from these overall conclusions.

1. The responsibility for housing market analysis and planning for housing in Northern Ireland at the strategic level should be brought together in a manner that reflects the Scottish experience and facilitates the bringing together of expertise in the inter-related fields of housing, planning, demography and economics to undertake the analysis of robust datasets that should underpin a unified approach to establishing a generally accepted spatial framework for housing market analysis and estimating future housing requirements.

2. Future analysis of the spatial framework for housing market analysis of functional housing markets should not only respond to ‘market signals’ but where appropriate should incorporate a tenure-specific component in major urban areas such as Belfast.

3. Further research is required that facilitates not only the identification of inter-tenure differences in migration patterns but also a greater understanding of the dynamics and motivations underlying migration decisions in the private rented sector that may well be impacted by important ongoing issues such as developments in the Government's welfare reform agenda.

8.3 Contribution to Knowledge

This thesis makes an original contribution to knowledge in a number of ways.

Firstly, the fact that this research was undertaken in the context of Northern Ireland has enabled cross-jurisdictional comparisons to be made that reflect the significant divergence that has taken place in terms of planning for housing policy and practice over the last two decades. It is hoped that this will contribute to further learning for Northern Ireland in relation to the contrasting experience of Scotland and England.

Secondly, the study has added to knowledge of the research process in this sphere. By enhancing House Condition Survey data with data on capital value and dwelling size from Land and Property Services database as well as combining this with more qualitative data it opened up avenues to explore the relationships that underpin spatial arbitrage and trading up /down. By using the relationship between capital value and dwelling size as an indicator the analysis highlighted the need for a more nuanced understanding of the relationship between socio-economic and socio-demographic variables that was corroborated by the regression models presented in Chapter 7.

Thirdly, it provided additional insights into an under-researched aspect of HMAs – the desirability of adopting tenure-specific HMAs in the context of larger urban agglomerations such as Belfast.

In the light of the key findings and conclusions, including too the contribution to original research, the thesis concludes that the research proposition that has guided its progress is upheld and therefore that in the context of Northern Ireland, the spatial framework for housing market analysis and planning for housing supply needs to appropriately reflect any tenure-related differences in household migration patterns.

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Appendices

Appendix 1 NIHCS Household Composition Groups

Lone Adult	One adult below pensionable age – 65 for men, 60 for women
Two Adult	Two people, related or unrelated, below pensionable age
Lone Parent	One adult living with one or more dependent children aged under 16
Small Family	Two adults, related or unrelated, living with one or two dependent children aged under 16
Large Family	Two adults, related or unrelated, living with three or more dependent children aged under 16; or three or more adults living with one or more dependent children aged under 16
Large Adult	Three or more adults, related or unrelated, and no dependent children aged under 16
Two Person Older	Two people, related or unrelated, at least one of whom is of pensionable age
Lone Older	One person of pensionable age

Source: NIHE, 2008

Appendix 2 Belfast Metropolitan HMA's Submarkets

This Appendix provides further details of the housing submarkets by O'Sullivan *et al*. (2011).

The analysis illustrated that the Greater Belfast submarket that provides the urban concentration at the heart of the Belfast Metropolitan HMA extends well beyond the boundaries of Belfast City: northwards, to include a significant part of Newtownabbey that is served by the M5 Motorway (Whiteabbey, Jordanstown and Mallusk); south-eastwards, to include not only Castlereagh but also the towns of Newtownards, Comber and along the main A7 artery to Saintfield; eastwards, to incorporate Holywood on the southern shore of Belfast Lough and Newtownards; and, finally, south-westwards, to encompass wards in the old Lisburn LGD that are adjacent to Belfast (e.g. Dunmurry, Poleglass, and Glenavy).

All of the remaining six submarkets that comprise the remainder of the Belfast Metropolitan HMA share part of their boundary with the core Greater Belfast submarket:

- Lisburn submarket: The City of Lisburn and the small towns of Moira and Hillsborough act as the hub of this submarket, but it extends westwards to include a small number of wards on the eastern edge of Craigavon LGD (e.g. Aghagallon) and southwards to include Banbridge town and Dromore and is well served by the main A1 road that runs south to Newry and Dublin.
- South Antrim submarket: this incorporates almost the whole of Antrim itself, Crumlin, Randalstown, and Templepatrick and their more rural hinterlands, but excludes Toome. It also includes Ballyclare and surrounding area that was located in the old Newtownabbey LGD.
- East Antrim submarket: this comprises the old LGDs of Carrickfergus and Larne. Migration patterns indicate connectivity between Carrickfergus and small settlements such as Ballycarry, Glenarm and Carnlough in Larne's rural hinterland, although migration between Carrickfergus and Larne Town itself appeared limited. The research team considered Larne Town to be very self-contained, possibly due to lack of recent inward investment.

- North Down submarket: This is the smallest of the submarkets and is centred on the seaside town Bangor with its good rail and road connections to Belfast, but encompasses other smaller settlements, including Groomsport, Donaghadee and Millisle.
- Ards Peninsula submarket: this predominantly rural submarket includes villages such as Portaferry, Portavogie, Greyabbey and Ballywalter. These settlements tend to be self-contained with little movement between them.
- Down submarket: this essentially rural submarket incorporates almost the whole of Down and is centred on the town of Downpatrick that acts as the local employment and service centre and is closely linked to Belfast by the A7. It also includes the settlements of Ballynahinch and Newcastle both of which have sizeable rural hinterlands.